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THE CLASSROOM BEHAVIOR SETTING--ITS NATURE AND RELATION TO STUDENT BEHAVIOR. FINAL REPORT.

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CONCEPTS AND METHODS FOR THE DESCRIPTION OF THE CLASSROOM BEHAVIOR SETTING ARE DEVELOPED THROUGH THE USE OF PRINCIPLES AND TECHNIQUES FROM ECOLOGICAL PSYCHOLOGY. THE ECOLOGICAL SUBUNITS WITHIN A THIRD-GRADE CLASSROOM SETTING WERE IDENTIFIED AND THE QUALITIES OF THESE SUBUNITS WERE SPECIFIED. THE SYSTEM, DEVELOPED QUALITATIVELY, DESCRIBES THE ENVIRONMENTS INHABITED BY A SAMPLE OF THIRD-GRADE SCHOOL CLASSES. TO ASSESS THE EDUCATIONAL RELEVANCE OF THE SYSTEM'S MEASUREMENT, RELATIONSHIPS BETWEEN THESE MEASUREMENTS AND TEACHER AND PUPIL RECORDS WERE ANALYZED. THE EVENTS OF THE BEHAVIOR SETTING FOR EACH OF SIX THIRD-GRADE CLASSES WERE RECORDED IN TWO-DAY CHRONICLES. ANALYSIS OF THE ENVIRONMENTAL SUBUNITS SHOWED THAT THEY WERE CLEAR, ECOLOGICAL UNITS. ACTIONS WITHIN ONE SEGMENT WERE HIGHLY INTERDEPENDENT. ACTIONS OCCURING IN SEPARATE SEGMENTS WERE INDEPENDENT. WITH THE CLASSROOM DAY DIVIDED INTO SEGMENTS, IT BECAME POSSIBLE TO MAP THE DAY, DIAGRAMMING THE CLASSROOM ENVIRONMENT. THESE DIAGRAMS CAN SHOW MAJOR DIFFERENCES BETWEEN EDUCATIONAL ENVIRONMENTS. SEGMENTS PRESENTED ACTIVITY CONTENT AS WELL AS STRUCTURE. TO DESCRIBE THE VARIOUS SEGMENTS, FIVE-CATEGORY SETS WERE DEVELOPED. THESE SETS ENABLED DESCRIPTION OF THE CONTENT OF THE CLASSROOM ENVIRONMENT. (PS)

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The Classroom Behavior Setting: Its Nature and Relation to Student Behavior

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The Classroom Behavior Setting: Its Nature and Relation to Student Behavior

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Paul V. Gump

July 1967

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INTRODUCTION

This investigation undertook development of methods and concepts for scientific description of the classroom environment. In the language of the author's research area, this study deals with the psychological ecology of the classroom. To an unbiased observer, the teacher's responsibility for creating and maintaining environments within the classroom must surely appear obvious. The development of drills, lessons, regimes, and rituals is a fact of the teaching life. Fact or not, social science research has attempted very little investigation of the classroom environment.

Conceptualization of the Environment

Several approaches have used environmental or ecological terms in their investigations, but very few have actually identified and measured the kinds of sub-environments or subsettings which teachers are continually establishing with and for their pupils.

The study offered here may be better understood through discussion of what is, and is not, intended here by the term classroom environment. Several environmental approaches are not congruent with the present orientation.

One approach to the conceptualization of the classroom environment is physicalistic and behaviorless. A child's environment includes the space, the objects, the light, the temperature, of his immediate surroundings; the child's environment does not include his own behavior because his behavior and environment for his behavior are maintained as separate realities. Nor is the behavior of others considered environment for the child since the physicalistic-behaviorless approach prefers to keep any behavior out of the concept of environment; it prefers to consider the physical factors mentioned as environment for all behaving persons. The approach described, then, limits environment to the clear, separate-from-behavior facts of milieu. Recent psychological developments in this area have been described in a collection of articles titled "Man's Response to His Physical Environment" (Kates and Wohlwill, 1966). The milieu-restricted concept of environment has the virtue of apparent conceptual clarity; the researcher can point at one factor and say "environment" and at another and say "behavior."

However, reflection indicates that, for any one person, the milieu-restricted environment refers to only a part of the input to a person from his environment; the milieu-restricted environment may be conceptually neat but it does not square with what happens to people--or to children in school.

The view taken in the present research is that children inhabit arithmetic lessons and milk and story times; they literally live in these combination milieu and action structure units; their behavior can be understood only by including the regime by which milk is drunk or the story read; and the behavior cannot be understood if the environment is restricted to the milk as a fluid and the story book as an object. Important and coercive as physical milieu factors may be, they do not constitute the full, patterned input to individuals; they are not, alone, their true environments.

Another approach to conceptualization of the environment comes from psychological field theory. Environment is life space; environment is what the input becomes as it encounters the person's meanings and motives. An article by Wright and his colleagues, "Toward the Psychological Ecology of the Classroom" (Wright et al., 1955), well expressed this attempt at conceptualizing learning environments. The environment emphasized in this work was the "psychological habitat," the world as it was for a particular child. Since the construct referred to the person and his perception, variables such as size of cognitive field, frustration, conflict, and time perspective figured prominently in the discussion. The psychological conceptions of the "psychological habitat" approach give it high behavioral relevance; if one knew a pupil's "psychological habitat," he could predict his behavior. However, this conceptualization of the environment is highly individual, interior, and circular. Behavior becomes a function of the person and his environment. However, since the environment is a function of personal meanings and perceptions, the environment is also a function, partially, of the person.

The environment, in the sense of an outside-the-skin set of inputs, was not ignored in this approach; sometimes Lewin used the term "foreign hull" in referring to it. However this exterior environment was not conceptualized in its own right. The environment became either enabling or constraining (but theoretically secondary) background for behavior, or elements of it became fused with the perceptions and meanings of the behaver. In the latter case, for example, the big ball upon which the child sat was not a ball but a seat. The undoubted correctness of the label seat should not drive one to assume that events outside-the-skin and apart from meanings of a particular person cannot be conceptualized as his environment. There may be an existence, a pattern, a lawfulness of this exterior which enable one to speak of a person's environment and not mean his life space or "what the environment is for him." Lewin (1936)

A conceptualization of environment which does not rest on the perception, the meanings, of individual inhabitants seemed to this investigator essential to the study of the classroom. Teachers cannot directly manipulate psychological habitats; they can, and do, strategically manage exterior habitats. The conception of environment preferred should be, to use Barker's term, preperceptual (1963).

A third approach to conception of the classroom environment has been presented by Gordon (1966) in a chapter titled "The Ecology of the Classroom." The predominant issues discussed in this chapter have to do with behavior of pupils and, more importantly, with that of teachers.

For clarity, discussion can center upon the appropriateness of description of teacher behavior as description of the classroom environment. For pupils, the teacher's behavior can be considered a part of their environment; her messages are an important aspect of what is happening around and to the pupils. Thus category codes such as "Teacher reprimands," or "Teacher demonstrates friendliness" (Gordon, 1966) are descriptions of input to students; most probably they are highly relevant aspects of their surroundings. Still, there must be dissatisfaction with this teach-message or teacher move conceptualization of the classroom environment; first, it presents too narrow a slice of the context in which pupils function. Furthermore, it puts the child in an environment but leaves the teacher out; the intuition one has about the classroom is that both teacher and pupil live in the same environment; they have unequal powers of environmental control but they share environments nonetheless. The classroom environment, it seems, should include the teacher, not simply be the teacher. Centering on the teacher as environment can have two different yields. Focus on acts in terms of their quality to the receiver--friendly, blocking, instructing, clarifying, etc.--is one type of centering; it gives a narrow slice and leaves the teacher out of the environment she creates. Another focus is the use of teacher behavior as a source of evidence about what is being created or maintained as an environment for both teacher and pupil. For example, a teacher may announce: "Let's have all the Red Birds at the front for a quick word review." The message is an input to students; but we can infer also a start of a new environment, a new setting, for all pupils designated Red Birds. The teacher message is both a pupil input and source of evidence regarding changes of environment. And the teacher will be an inhabitant of that new environment, not just a provider of environmental input to students.

A Basic Environmental Unit in Ecological Psychology

The concept of environment employed in the current research was described by Barker and Wright in their volume Midwest and Its Children (1955) and further developed by Barker in Introduction to Ecological Psychology (1968). In the Barker and Wright view, the classroom is a behavior setting; the activity units within it, such as the Red Birds at the front, are types of subsettings. The behavior setting conceptualization includes those factors mentioned in physicalistic environmental conception and refers to them as milieu; the behavior setting understanding declares that behaviors are an absolutely necessary aspect of settings but that perceptions and meanings of behavers are not necessary for their identification; the behavior setting is preperceptual. Finally the behavior setting is a context for persons and their behaviors; it is not limited to a description of how one person's behavior functions as environment for another.

Since the behavior setting concept is fundamental to the present research, a definition and some discussion of that definition are appropriate.

> ...A behavior setting has both structural and dynamic attributes: On the structural side, a behavior setting consists of one or more standing patterns of behavior-and-milieu with the milieu circumjacent and synomorphic to the behavior. On the dynamic side, the behavior-milieu parts of a behavior setting have a specified degree of interdependence among themselves that is greater than their interdependence with similar parts of other behavior settings.... (Chapter 3, Barker, 1968)

Crucial terms, as these apply to the classroom, are the following:

...standing patterns of behavior...

These are behavioral gestalts in classrooms that are characteristic of the inhabitants' activity: teacher explains and pupils listen; teacher and pupils together stand and say the Pledge of Allegiance. These activity patterns are not characteristic of particular pupils or teachers; they are extra-individual behavior phenomena like ball games and commuting traffic; they persist even if participating pupils or teachers change.

...standing patterns of behavior-and-milieu...

The behavior patterns are linked to nonbehavioral factors. The teacher's explanation is made in a space at the front of the room, using book, blackboard and chalk. Pupils sit in desks positioned toward the teacher; the entire operation is supported by arrangement of space and props to facilitate privacy, effective communication, and (hopefully) diligent study. Time constellations are a part; the teacher's explanation follows the Pledge; it lasts about eight minutes. The milieu is not the behavior setting; if the behavior stops and the milieu continues, the behavior setting ceases to exist. The behavior setting "third grade classroom" usually closes down about 4:15 p.m. Parts of the milieu may be used in the evening but usually for a new behavior setting, perhaps the executive meeting of the P. T. A.

...milieu circumjacent to behavior...

The classroom, as milieu, surrounds, encloses the standard pattern of behavior which occurs there; the classroom time--from 8:45 a.m. to 4:15 p.m.--encompasses the classroom behavior.

...with milieu synomorphic to the behavior...

Behaviors in the third grade classroom and their milieu have fit; they have a similar structure, a synomorphy. Chairs may have arms for writing, blackboards are raised for ease of looking at and writing on, and the room shuts out playground noise thereby making it possible to hear the teacher's explanation.

...the behavior-milieu parts of a setting...

The components of the classroom behavior setting are not physical things and areas on the one hand and behavioral patterns on the other; it is easier to think of them separately since such has been the scientific custom. However, a component of the classroom setting is standing-on-the-floor-and-facing the flag at the front and-repeating-the words "I pledge allegiance...." This is a component of the day;

floor, *flag*, and *front* may classify in a different conceptual realm but they are inextricably linked to the behavior; these milieu factors are part of a component; this component in Barker's terms is *behavior-milieu synomorph*.

...have a degree of interdependence *among themselves*...

The components, the behavior milieu synomorphs, within a classroom are dynamically related, a change in one is likely to bring about a change in another. If the children in the Reading Circle take too long closing down their work, the children in Morning Seatwork must wait longer for the recess dismissal time. The waste-paper-basket-being-passed-up-and-down-all-aisles is a synomorph; pupil behaviors with other objects (other synomorphs) are dependent upon how things go with the waste-paper basket synomorph.

...that is greater than their *interdependence* with similar parts of other behavior settings...

A particular third grade classroom has some relationship to other school settings: to the principal's office, to the fourth grade across the hall, to the playground. However, what makes the third grade a unit is that its components function together and do not function, to the same degree, with similar components of other settings. A waste-paper-basket-passing component exists in both the third grade room and in the fourth grade room; *they are highly similar synomorphs but there is no* functional relationship between them; they have a low (almost nonexistent) degree of interdependence. Other synomorphs of the third and of the fourth grade have the same similarity yet functional independence; the interdependence within and independence between is that which gives each setting its separate identity and its integrity.

The present effort extends the behavior setting research ideas toward the interior dynamics of settings. For certain purposes treating a classroom as one large unit extending over 185 days is quite helpful; such inclusiveness makes it possible to speak of, to measure and compare, institutional and community totalities through references to reasonably inclusive subunits within them. A comparison of an English and an American town with their behavior settings as the basic unit is an example of such research (Barker, 1967). However, for other purposes, the behavior setting unit, left as a unit, may be too inclusive. The present research seeks to understand the classroom behavior setting by analyzing its components, the synomorph clusters within it; the particular clusters of interest were activity structures-coupled-with-milieu factors which appear to be the classroom's subsettings.

Studies of Settings and Behavior

Studies of extra-individual behavioral units exist in several areas of psychology. These researches have shown that significant behavioral reactions can be influenced by the nature of the unit inhabited. For example, the investigator and others have investigated setting impact by recording specimen records in the fashion described by Barker and Wright (1955). This method provided reasonably accurate and detailed pictures of participant behavior and of the events immediately surrounding it. Records were taken of the same children as they inhabited different settings. Coding of the specimen records yielded data for comparison of behavior in different milieus. A study of the social behavior of the same 23 boy campers in a swim and in a crafts setting showed that social actions in craft, as compared to swims, were less frequent, less robust and more counselor-dependent (Gump and Sutton-Smith, 1955). Other studies indicated that reliable and consistent differences in patterns of social interaction could be related to behavior setting variations (Gump, Schoggen, and Redl, 1957; Gump and Kounin, 1959-60; Gump, Schoggen, and Redl, 1963). Other investigators dealing with children in residential settings have also developed evidence that interpersonal relations are coerced by setting contexts. Raush and his associates (1959, 1960) studied interactions of both disturbed and normal boys in a residential treatment milieu as related to variations in "social situations" (food and nonfood settings, or games and crafts activity).

In clinical and educational research it is customary, when attempting to understand behavior, to relate its variations to personality differences. In this connection a quotation from the Raush studies is interesting:

> ...It can be seen that settings generally contributed more information and had greater effect on reducing predictive uncertainty about behavior than did individual differences among children. In this restricted sense the social situation was a more important determinant of social behavior than was personality of the individual child.... (Raush, H. L, Dittmann, A. T., and Taylor, T. J., 1960, p. 325)

The Raush investigations also demonstrated that setting and personality in interaction yielded markedly more influence than the sum of each taken separately.

Some studies (Gump, P. V., Schoggen, P., and Redl, F., 1957) indicate that the social behavior of leaders as well as children is coerced by setting variation. This result, if found in school settings, should imply that although a teacher can control activity selection, an activity once begun can control the teacher.

The above studies were related to children's recreational or treatment groups; a few studies show that school settings and variations between them can affect both student and teacher behavior. Kowatrakul (1959) related student behavior to classroom activities and to subject matter. Activities were Independent Seatwork, Discussion, Watching and Listening, and they referred to classroom subsettings or action structures, not to individual student behaviors. In two classrooms it was found that certain subject matter variations and activity variations were significantly and consistently associated with differences in student response.

For example, "illegal behaviors" were most frequent in the Discussion setting. A fact not emphasized by Kowatrakul but pertinent to the present research was that activity variation was usually associated with more variations in student behavior than was subject matter variation.

An extensive study by Hughes and her associates (1959) dealt in part with the classroom behavior of 35 teachers in relation to curricular offerings in the classroom. Compared to other curricular sections the Activity Period produced in teachers significantly fewer acts, fewer controlling acts, more personal response, and more negative affectivity. This study also indicated that teacher behavior was as closely related to curricular offerings as it was to teacher personality. In short, *where* the teacher was in curricular activity turned out to be as important as *who* the teacher was.

A final fact of the Hughes study stresses thatteachers are coerced by classroom settings. Some categories of social action were combined to form an index of Dominative Behavior. The lowest amount of Dominative Behavior for any of 35 teachers was 48 per cent. Evidently situational factors in the classroom demand dominative behavior somewhat irrespective of teacher personality. A study by Dyck (1963), comparing teachers to parents, yielded results which support such a conclusion.

An extended discussion containing variables for description of one part of the classroom environment has been offered by John Herbert; his book is titled *A System for Analyzing Lessons* (1967). Setting components such as media, grouping and location of pupils, and action structures (lesson forms) are integrated into a descriptive theory of teaching behavior. Although the Herbert system is based on extensive review of primary data from actual classrooms, it does not attempt to demonstrate empirically the relationship of teaching or setting variables to pupil behavior.

An impressive research contribution to the problem of variations in the classroom environment and pupil behavior has been offered by Kounin and his associates (1966). The subsettings in the Kounin study included "seatwork in teacher sphere" (i.e., teacher present in the activity; not engaged with other pupils), "seatwork not in teacher's sphere," "class recitation," and "subgroup recitation." Although the burden of the Kounin work centers upon teacher moves and their effectiveness with disturbed and nondisturbed children, environmental structures are used to locate areas of study. Environmental units such as "activity subsettings" and elaborations from them are utilized in the Kounin work. Examples of the elaborations include: "programmed variety within and between subsettings," and teacher behavior around "transition points" as strategic spotsat which to sample teacher effectiveness. Kounin reasoned that managerial competence of the teacher would be well displayed at these spots.

Correlations between teacher's "transition-resolution" scores and the work involvement rate of children in seatwork and in recitation were encouragingly significant. The research importance of a successful use of a point in the environmental structure should not be minimized. Technology now makes it possible to record all teaching behavior for many teachers for whole days of school. In order to manage such deluges of data, the question must arise: What behavior shall have prior and intensive attention? One solution is selection according to crucial environment or subsetting phases. This would seem more promising and more realistic than arbitrary and pattern violating time-sampling.

The study to be reported shares much with the Kounin work; the major difference rests in the place of the ecological variables in the research purposes. Kounin used setting variables as necessary frames for an investigation of the effects of teaching behaviors upon elementary school children. The present study treats similar environmental units and their variations as the research target; teacher and pupil behaviors are studied in order to clarify the nature and the impact of these setting phenomena.

Kounin recorded long spans of classroom activity (first half-days, later full days) and delineated subsettings within these spans. By contrast, the project represented by Adams and Biddle selected mathematics and social studies lessons as given by forty-eight different teachers at the first, sixth, and eleventh grade levels (Adams, 1967). Total classroom behavior during these lessons was video-taped and then subjected to intensive coding of all teacher-pupil or pupil-pupil communicative events. In their data analysis, Adams and Biddle assiduously rejected the use of such ecological units as subsettings. Instead, the total stream of teacher and pupil behaviors was inspected and every change in the structural or functional characteristics of the communication was employed as the beginning of a new "episode." An episode was the only unit that might be bigger than one person's act and these were quite short, averaging 4 to 17 seconds. Although ecological units within the lessons were not investigated, as such, the lessons themselves, in terms of the present research, were subsettings; the data reported by Adams (1967) clearly show that these subsettings yield contrasting teacher and pupil role behaviors. For example, mathematics was associated with more teacher domination; social studies provided greater role variety for teacher and pupils.

The completeness of data recording and data analysis represented by the Adams report is quite impressive. The complete avoidance of ecological concepts in favor of sociological and psychological ones provides a challenging contrast to the present study. Adams and Biddle maintain that their data present great complexity and detail and that this is inevitable if one is to deal analytically and objectively with all that happens in a busy classroom. The present investigation is based upon the idea that complexity and detail are more or less massive depending upon whether or not the investigator can identify the ecological "wholes" which, in nature, bind and organize the event details. If analysis of the data separates events into molecular bits and eliminates their ecological anchorage, then the task of classifying and organizing the bits can, indeed, become enormous.

In terminating this discussion of research related to settings and behavior, note should be taken of the rapidly expanding effort in direct classroom observation. Numbers of investigators, using different researching and analysis techniques, are studying a variety of problems. Communication among these investigators has been haphazard and fortuitous. Biddle has attempted to order the field by describing recent investigations in terms of their problem coverage, methods of data collection, units of analyses and "conceptual posture" (1967). The Biddle contribution has been useful in the present investigation; it provides a well-delineated sketch of "where we are" in observational classroom research.

Objectives of the Research

This research has attempted development of methodology and concepts for description of the classroom as a behavior setting. Different levels of setting description were anticipated. First, there was description of the classroom in a primary, or unanalyzed fashion. Such an account should present events (and associated persons and objects) with a minimum of abstraction and in a form which preserves the basic spatial and temporal event patterning. Secondly, there was description at a more summary and abstracted level which required a system for identifying and delineating environmental units within the classroom behavior setting and for determining their properties.

Descriptive schemes are judged on the basis of their utility in yielding understanding. In the present case the issue was not only whether descriptions at each level could be made, but whether such descriptions helped in understanding significant classroom relationships. For example, would these methods of description help in understanding how aspects of the classroom environment were related to aspects of teacher and pupil behavior?

To answer this question, a secondary objective arose: the recording and analysis of teacher and pupil behavior in sufficient detail so that measurements derived from these sources could be related to more environmental or ecological measurements.

In summary, specific objectives of the research include:

(1) Development of a method for describing classrooms as specimens of ongoing environments. Eventually these specimens became full day recordings of classroom activity; they were termed classroom chronicles.

(2) Development of a method for delineation of units within the classroom behavior setting. These units were labelled segments and were such activity-pieces as "Flag Salute and Song," or "Far and Near Reading Group."

(3) Development of measures descriptive of segments and times of segment change (i.e., transitions). For example, segments could be described according to the business with which they were concerned (reading vs. art) or according to the action role assumed by the teacher, and so forth.

(4) Development of methods for recording and analyzing details of teacher and pupil behaviors during the classroom day.

(5) Determination of the usefulness of the descriptions of the classroom in terms of its segments and transitions by relating segment measurements to teacher and pupil behavior.

METHOD

Description of the project's methodological activity can be divided into phases: the early exploratory efforts and later systematic data collection. We shall refer to these phases as Exploratory Work and Major Study.

Exploratory Work

In order to ground research plans in direct experience with the classroom phenomena, a number of classroom visits were made. The investigator attempted to discover cues for the identification of intra-classroom activity units, to infer dimensions descriptive of these units, and to hypothesize possible effects upon teacher and students of various kinds of units. At the same time the investigator also considered methods for the collection of primary data. Since the problems pursued in this research were new, it had been decided to avoid pre-coding of information; instead the plan was to collect data which could be unitized and categorized by review of primary records.

Events in the classroom involve diverse behaviors of twenty to thirty children and a teacher together with numerous materials, tools and facilities; the number of possible observational and recording targets is overwhelming. How is one to manage these data? Gradually the experience of the classroom visits made it clear that two different sorts of solutions would have to be attempted: an appropriate focus would have to be developed so that the resulting records would contain data for the outlining of the activity structure of the day's activities; a technique would have to be discovered to record more material than was possible with the pencil-paper method.

In learning how to focus, the investigator became aware that only certain facts are necessary to the delineation of the activities in the classroom: signals by the teacher that a phase was beginning or ending; blackboard outlines that stated which children were to do what, when; movement of groups in taking out and putting away tools and materials; movements to various parts of the room. These and similar events, if preserved, make it possible to outline or to "map" the activity areas of a classroom day.

Focus could not solve all of the problems, however. If it was desirable to describe the nature of the activity parts, as opposed to simply marking their boundaries, considerable recording of what the teacher said and did would be required. The teacher's explanations or her questions provide central content to many of the class activities. Occasionally other sources of content for activity are provided: students' reports, film strips, recordings, etc. For the classrooms observed it seemed possible for the observer to record this material if he could keep his attention upon events (as opposed to notepad) and if he could rapidly narrate (as opposed to write) what occurred.

These requirements were met by use of a device which prevents dictation sound from reaching the surroundings, the Stenomask, and a portable tape recorder, the Dictet. This method of recording has been described by Schoggen (1964).

The research was also concerned with the impact of various classroom structures upon pupils; it was clear that a method for recording behavior of pupils would have to be devised which did not tax the observer. For example, the observer could not code the behavior of each child in turn and still maintain his recording of the boundaries and contents of the classroom activity parts. The investigator decided to employ photography, a method which would preserve samples of pupil behavior for later analysis yet make little demand upon the observer.

Use of the Stenomask-Dictet recording of classroom events and photography of student behaviors was given a rather extensive tryout in an elementary school summer session. The investigator appeared the morning of the first day of summer school and recorded the third grade beginning its session; he continued recording this class at intervals throughout the six-weeks session. In order to broaden his experience, the investigator also recorded six sessions of a fourth grade summer school class. Thus, two classrooms were observed and recorded for a total of 29 hours on 19 different days.

The actual procedure for the observation in the third grade involved the investigator sitting at the side of the room and narrating into the Stenomask the events which marked the beginnings, ends, and major contents of the activity sections. Time was noted about every minute or so and also at clear change points. Every two and a half minutes a picture was taken. (A Leica camera with a very quiet shutter and a 21 mm.lens permitted coverage of about 80 per cent of the classroom area.)

Through this summer school experience a number of understandings relating to data collection and analysis were developed. Many of these guided methodological steps in the Major Study. The effect of the observation process upon the children observed received attention. Not surprisingly, sensitivity varied according to the child; some almost never looked at the camera or at the man beside it; others might watch through several classroom shots. Fourth-grade children watched the observer more than third-grade children. Further, when the action in the classroom was busy and involving, the observer and his equipment would be ignored by everyone. For example, when the fourth-grade students were at seatwork, camera watching averaged 7.5 per cent; when these same children were constructing a craft project, camera watching was less than one per cent.

The manner by which the pictures were taken also seemed to make a difference. The observer's movement in raising and aiming the camera would sometimes catch the attention of a few children and hold it until the shutter clicked. This problem was met by using a tripod with a long cable release. Pictures were then taken with no attention-arousing prelude; camera watching, as judged from photographs, dropped from 12 per cent to 5 per cent in the fourth grade. Camera watching was never a serious problem in the third grade since the highest rate on any day was 3 per cent and averaged less than 2 per cent over the entire summer.

Experience in the summer school effort indicated that the general lines of the methodological practice were correct. In the first place, it was possible to outline classroom activity from the dictated records. Furthermore, these outlines showed differences between the third and fourth-grade classrooms; for example, there were more subgroups and more activity changes in the third grade. Also, the photographs of pupil behavior were codeable and results showed statistically reliable and sensible differences: third-grade pupils, as opposed to those of the fourth grade,

(1) more frequently oriented toward the teacher,

(2) more frequently engaged in the actions of the prescribed activity, and

(3) less frequently exhibited signs of boredom or fatigue.

Examination of the summer data also indicated ways in which the method could be improved. Although recording of teacher behavior was detailed with regard to signals for the beginning and end of activity, her behavior during a particular activity was merely sketched in. It had been thought that the observer would be overloaded if detailed teacher behavior were required; furthermore, it was essential that the record as finally developed be one of classroom operations--not of leader behavior alone. After some practice, the observer found it possible to take more detailed records. More importantly, it was discovered that, for the most part, a record of ongoing teacher behavior was a record of classroom operations. Pupils engaged in an activity were usually guiding their behavior in terms of the immediately ongoing action of the teacher. There were notable exceptions: when some children studied at their seats while others were with the teacher in a reading circle, the studying children did not guide their behavior according to that of the teacher. Fortunately, study activity is of such a nature that accurate description does not require continuous observation; it may be recorded once and it will not ordinarily change or develop over time. More serious exceptions to the rule that teacher behavior was classroom operation were those cases in which pupil-led subgroups carried out their own learning sessions. Here a record of teacher behavior, which was directed to individual students or to a reading circle, was not a record of the student-led activity. Exceptions of this sort were infrequent and were handled by noting their site, their population, their general format, and their start and finish times. Beyond this, the observational target remained the teacher. Such a solution permitted outlining and general description of all activities in the classroom period; it did not allow for quantification of important aspects of the student-led activity. For example, the number, kind, and sequence of leader acts were not available.

The summer's experience gave confidence that a record of teacher behavior, properly supplemented, could yield a relatively complete outline of classroom activity. Accordingly, it was decided that future recording of teacher behavior would be as systematic and complete as feasible. Specimen records, as these forms of behavioral data have been described by Barker and Wright (1955) were decided upon. These ✓ behavioral data would serve two purposes: provide evidence (along with supplementary charts and notes) to reconstruct the action format of the classroom day; and, provide details of how the setting manager, the teacher, was reacting within this format.

A second improvement related to photography of pupil behavior. The practice was to photograph classroom events every two and one-half minutes: this minimized observer work load, and, if the activities were long enough (15 minutes or more), it yielded sufficient samples of pupil behavior. When activities were short, however, the number of pupil samples were too few. Also the interval was unsuitably long if one desired data during and around transitions. As it turned out, one activity could end and another get well under way during the two and one-half minute interval. Clearly it would be helpful to take pictures more frequently; to relieve the observer, it would be best to have them taken automatically, without requiring the observer's attention.

Reflection upon the summer school data supported some speculations about the relation between classroom organization and response of teachers and pupils. It appeared that the greater activity variety and subgrouping of the third grade required more teacher effort, that the number and the kind of teacher acts were higher in this situation than in the simpler fourth-grade format. Variables of pupil behavior (teacher orientation, work involvement, and boredom) seemed associated with the greater activity variety in the third grade. However, other differences, beyond organization, existed between these two classrooms (age of pupils, boy-girl ratios, teacher manner) so that one could not attribute the teacher and pupil behavior differences to variations in organization alone.

Other associations were apparent within the third-grade classroom: for example, pupil involvement was higher in small subgroups than in recitations of the whole class. Such a finding is limited since generalization is not possible when only one teacher and few children are involved. While such speculations as the above could not be adequately checked with the available data, they did serve as guiding questions in the subsequent investigation.

Major Study

Considerations of method typically include target situations and subjects, data collection techniques, and analytic methods. In the present research, suitable analytical approaches were not developed prior to data collection; these were devised on the basis of the obtained data. In one sense, the analytical tools became results, perhaps the most important results, of the investigation. Therefore, the following discussion considers first the situations studied and the method of data collection; it reserves a special section for development of analytic techniques.

Situations Studied and Methods of Data Collection

Selection of Research Situations

To eliminate significant variations in pupil age and to insure repetition of curricular offerings, the Major Study dealt exclusively with third-grade classrooms. Nineteen classrooms of University City (population 28,000) were observed and their teachers interviewed. The purposes of these contacts were to assess the range of third-grade classroom practices occurring in the city and to learn of the teacher's ideas concerning the effects of various classroom activities upon pupils. Once the observations and interviews were concluded, the researcher was in a better position to select classrooms for systematic investigation. Selection was accomplished so that at least two teachers were at the high and low ends of three dimensions. Pupil Academic capability was high for classes under Mrs. Apple and Mrs. Eddy, low for classes under Mrs. Berry, Mrs. Carr and Mrs. Ford. Novelty of presentation was high for Mrs. Apple and Mrs. Berry, low for Mrs. Dodd and Mrs. Ford. Managerial efficiency seemed good for Mrs. Carr and Mrs. Eddy, less good for several others.

It was also desirable to gain some repetition of events. Accordingly, the plan was to record two full days operation in each of the six classes.

The classrooms selected are described in Table 1. Academic rating is based upon group intelligence and achievement tests. Social class ratings for the school's neighborhood, if presented, would correlate highly with the academic rating.

The six classrooms were selected to offer variety and yet be reasonably representative of the schools in the community; it was not believed that selection offered, in all cases, dependable pre-established contrast situations. Contrast situations would be exploited as the research findings indicated their existence; such situations would ordinarily involve comparisons of activities across classrooms rather than one set of classrooms in contrast to another.

Development of the Chronicle

The primary records from which data analyses were made were of two types: chronicles of teacher behavior and classroom events, and 16mm. time-lapse photographs of pupil behavior. The chronicles were used to describe the structure of classroom affairs (the boundaries and the qualities of activity parts) and to display the teacher acts in management of these parts. The films were employed to judge the aspects of individual pupil behaviors.

Table 1. Characteristics of Recorded Classrooms

Teacher		Pupils				
Pseudonym	Estimated Age	N Boys	N Girls	N Total	Academic Rating	Race
Mrs. Apple	27	12	14	26	High	Caucasian
Mrs. Berry	32	8	15	23	Low	Caucasian Negro Latin
Mrs. Carr	57	10	11	21	Low to Medium	Caucasian
Mrs. Dodd	25	14	14	28	Medium	Caucasian
Mrs. Eddy	52	13	13	26	High	Caucasian
Mrs. Ford	28	14	16	30	Low	Caucasian Negro

The chronicle was dictated by three observers, operating in sequence, during the day. Two observers were highly experienced in the specimen record technique, the third was trained by the other two. The observers dictated their running record into a Stenomask and Dictet unit. (see Schoggen, 1964) The records were transcribed by a typist and edited by the observer. The observer was responsible for a record which would enable the reader to determine at any time what major activities were in operation and what actions the teacher was taking in teacher-led sections. It is important to note that although the classroom chronicles are highly similar to specimen records, they are not, in principle, identical to them. A specimen record is of the behavior and situation of a single person. A specimen record maintains a focus upon the what and how of a particular person's behavior. This focus continues when the individual is passive or withdrawn from ongoing action as well as when he is involved; furthermore, this approach describes only enough of the individual's situation to make the individual's behavior meaningful.

The classroom chronicle, on the other hand, maintains a focus upon the activity-center of a classroom; for the situations encountered, this activity-center was almost always the teacher. A record of what she did and what was done with regard to her was a record of most of the classroom action. Of course, the chronicle technique requires that the outline of events be maintained for those instances in which teacher behavior does not reveal it. Thus, if classroom organization changes without teacher signals, the change must be described. Such occurrences in the third grades studied were rare.

Supplementary materials were added to the chronicle's narrative account: photographs of the four walls and a map of the classroom provided frames for action described in the narrative; copies of materials used by children (pages of reading, columns of arithmetic, samples of art projects, etc.) were useful in clarifying the nature of activities alluded to in the narrative.

Excerpts from the chronicle of Mrs. Apple's classroom are displayed in Appendix A. The methods by which chronicles were unitized and how these units were described is discussed later in this report (p. 20 ff.).

Photography of Pupil Behavior

The technique for recording pupil behavior employed in this study was identical to that described by Kerkman (1963). A 16mm Bolex camera, equipped with a wide angle Switar f-1.6 10mm lens, was linked with a solenoid. Camera and solenoid were enclosed in a soundproof box and mounted upon a 7 foot tripod. A timer was also placed in a soundproof box and linked to the solenoid. The timer was set to take a picture every 20 seconds. The equipment was placed in a front corner of the classroom. From this position, 70 per cent to 90 per cent of the classroom area was included in the picture. Dupont 913A high speed rapid reversal film was used; the film and lens usually performed adequately in the light naturally available in the classroom.

Once the observer wound the camera motor, and arranged the equipment, he was, theoretically, free from concern with this equipment for one-half of a school day. (In practice, the observer would occasionally feel the tripod leg for vibration from the solenoid thrust. If the thrust was absent, the observer would adjust the equipment.) Under most conditions, however, the observer did not concern himself with photographic equipment.

By projection of the film on a screen, it was possible to code pupil behavior in terms of its apparent involvement in the ongoing activity and other variables. Since pictures were taken every 20 seconds, a natural timing existed which was useful in matching pupil behavior to the timed material of the chronicle.

The use of the equipment in the classroom was not hidden. Camera equipment, recording equipment, and observer were in plain sight. However, some effort was devoted to adaptation to the strange props and the observer.

At the beginning of the afternoon session on the day preceding a scheduled observation, one observer explained the research to the pupils; he demonstrated how the equipment worked, he let pupils touch and hear the recording mechanisms. Afterward, he went to work "observing and recording" classroom events. Actually no data were taken but the children and teacher had half a day to become accustomed to the equipment and the observer prior to actual data collection.

Ecological Units

A primary goal of the investigation was development of concepts and methods for description of the activity units occurring within the classroom. Such description involves unitization of the activity stream and rating of qualities of the obtained units.

Delineation of Intra-Classroom Units: The Segment

Reading of Appendix A will convey the nature of activity differentiation for Mrs. Apple's classroom during a part of one morning. The chronicle exhibit begins with a kind of elementary school study hall; this section of the activity is labelled: "Morning Seatwork." Although the pupil personnel of this seatwork activity changed during its span, the general form of this activity remained quite constant. While some students were studying, Mrs. Apple explained a worksheet assignment to a reading group: "Friends Far and Near Worksheet Directions." The teacher's explanation was interspersed with question and answer activity. At this point in the day, there were two clearly separated activities: a seatwork unit ran parallel to an explanation-recitation unit.

The explanation unit dissolved back into the seatwork group and Mrs. Apple then organized a new group into the activity: "New More Streets and Roads Reading Group." These children met in a semi-circle at the rear of the room. This activity, in contrast to the seatwork, exhibited several changes during its existence. At the beginning, children were engaged in a diction exercise: "Word Usage Drill." This activity was contained within the larger reading unit. Following the diction drill, the children and teacher considered the story they had been studying: "Discuss Story." This second activity was also contained within the larger span.

At the finish of the reading circle activity, the seatwork segment was interrupted and the entire class prepared to go to the gymnasium: "Going to Gym." The preparation involved a form of row by row turn-taking and a set of teacher-instructions.

Events within the period just described can be diagrammed or mapped. The organization of this period is displayed in Figure 1. (An exhibit of a map for an entire classroom day can be found in Appendix B.) As demonstrated in Figure 1, classroom activity exhibits longitudinal and cross-sectional differentiation. Two or more activities, each with its own personnel, business and facilities may exist simultaneously.

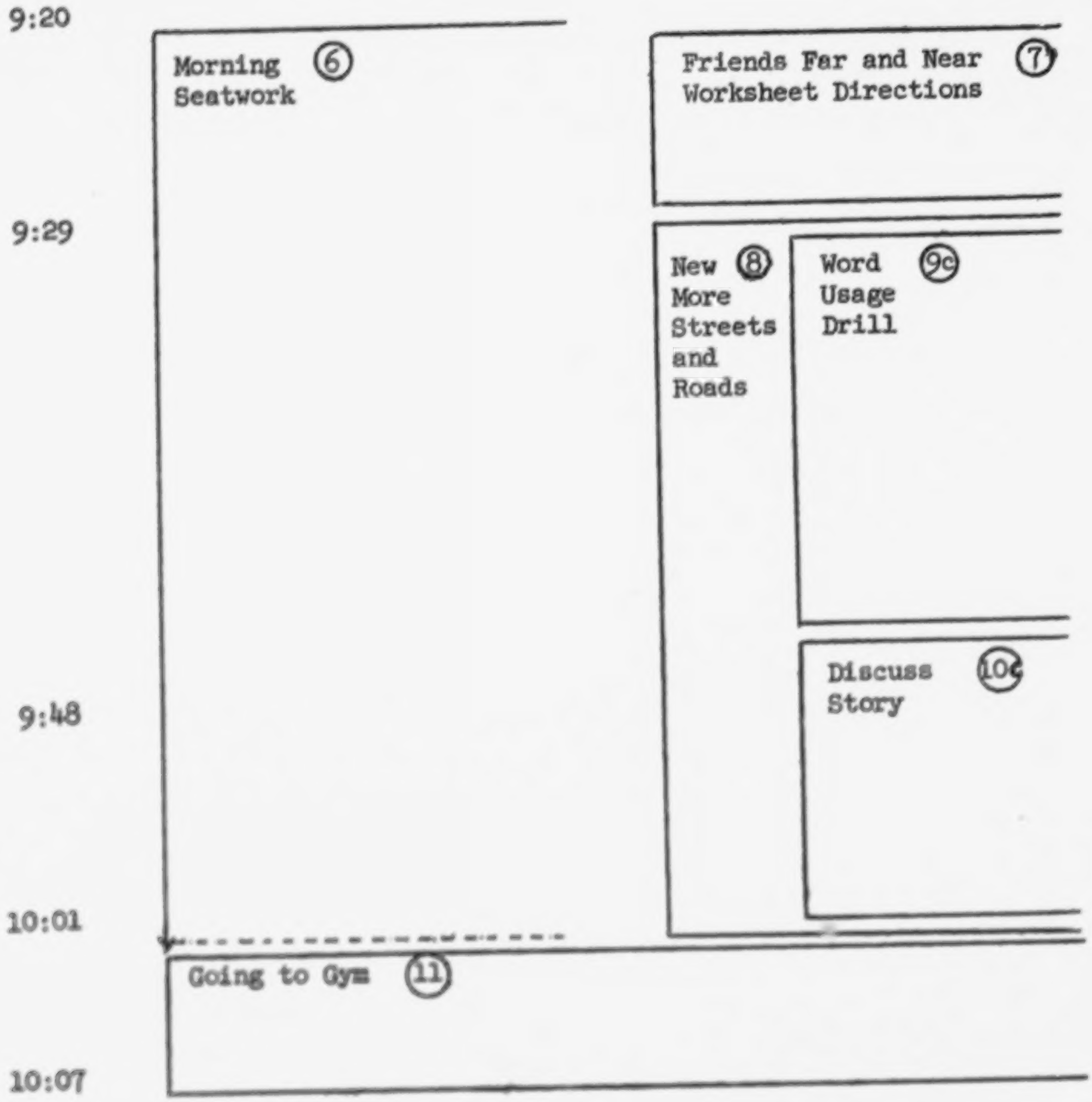
9:20
9:29
9:48
10:01
10:07
Morning Seatwork ⑥
Friends Far and Near Worksheet Directions ⑦
New More Streets and Roads ⑧
Word Usage Drill 9c
Discuss Story 10c
Going to Gym ⑪

Figure 1. Organization of Mrs. Apple's Classroom

from: 9:20 a.m. to: 10:07 a.m.

The cross-sectional view of Mrs. Apple's classroom shows two simultaneous action arenas operating from 9:20 until 10:01; after this, the class becomes an en masse unit. Examples of longitudinal differentiation occur in the arenas on the right when activities change at 9:29, 9:48, and 10:01.

Although major segments can function simultaneously, a major segment and a segment contained within it do not operate simultaneously. A contained segment, while in operation, is the actuality of the major segment. Thus, Segment #8, "New More Streets and Roads," is represented almost completely by Segments 9c and 10c. (Theoretically it would be possible for two contained segments to exist simultaneously within a major segment; a teacher might subdivide a reading group; this structure was not observed in the present study, however.)

The outline of third-grade activity in the chronicle illustrates the action subdivisions within the classroom. A subdivision has been labelled a segment. The word segment was chosen to communicate the internal integrity, the boundedness, observed in these parts of the classroom day. One of Webster's definitions carried the meaning intended:

> "Segment: One of the constituent parts into which a body entity or quantity naturally divides." (Webster's Seventh Collegiate Edition)

In terms of this definition, the segment is not an arbitrary slice or piece of activity--as a ten minute section of time--but a "constituent part" of a classroom day. Events within the segment are more related to one another than they are to events outside the segment. Put in other terms, elements within the same segment show relatively high interdependence; elements located in different segments show relatively low interdependence. The segment structure of classroom activity is a pattern that can be seen by any knowledgeable observer.

Listed below are those aspects of a segment which give it its identity and which are checkpoints for determining whether or not there has been a change in segments:

> Temporal boundaries and internal differentiations. An activity begins and ends at particular times. Usually there are signals; in a third-grade classroom, these signals frequently come from the teacher. Sometimes an activity will have phases or internal beginnings and endings.
>
> Spatial location. A segment occurs someplace; quite often this place has a clear suitability for the action that is to occur. Most third-grade activities occur in the classroom and some have special sites within that locale. For example, the group that is to read and discuss together has an out-of-the-way spot in the back of the room. Chairs for this group are turned with their backs to the major part of the room to increase the seclusion. Other site provisions are often made for painting, science, committee work, etc.

Behavior objects. Action usually requires tools and materials. Books, papers, pencils, desks, etc., are objects sustaining classroom behaviors.

Participants. Segment action is sustained by people. In many cases a segment will have a special personnel: those children studying "Friends Far and Near," or the group of girls working on the mural. Changes in population distribution usually signal changes in segments; the splitting of pupils into groups often begins parallel segments. The reciprocal of this is not true; that is, absence of a personnel change does not imply that the same segment is continuing. The entire class may study arithmetic and then the entire class may study spelling; in this case the segment changes even though people remain the same.

Activity format. Learning sessions involve patterns of behavior. Familiar patterns include; the recitation, the test, the group discussion, the art period, etc. The pattern is describable from two points of view: the kinds of actions people engage in, and the interpersonal relationships of lines of action. The first view is a look at the behavior mechanisms in operation: talking, listening, manipulation, etc. The second view looks for action roles of classroom participants: teacher asks questions and pupils answer, pupils play spelling game and teacher referees, etc.

Concern or business. Classroom segments are established to deal with academic and nonacademic concerns. As one observes a span of activity it becomes clear that arithmetic, or rest, or ritual, are the businesses at hand. This perception arises from the topics of talk and from the kinds of behavior objects involved in participant behavior.

The unitization of the classroom chronicle involved deciding where one segment left off and another began. To make this decision, the unitizer read the record for signs that any of the above factors had significantly changed.

When deciding upon a unit change the major considerations were concern and activity format. Changes in behavior objects, locations, and participants were reliable indications of activity pattern and/or concern changes but were not taken as absolutely determinative. It also seemed reasonable to consider a continuity of major concern as a continuity of segment. If minor changes of concern or if changes in activity pattern occurred within this continuity, these were handled as beginnings or endings of contained segments. Thus the concern of Reading persists throughout the segment "The New More Streets and Roads, 8" but within this continuity the particular topic and activity pattern shifted as the group went from "Word Usage Drill, 9c" to "Discuss Story, 10c."

The question of just how much of a change in concern or in activity format is required to decide that a new segment has begun was settled partially by use of the Code for Segment Qualities presented on page 25 .

A major segment change was said to occur if there was a change such that a new concern code category was required. For example, if the activity description had to shift from Ritual to Mixed Academic, then a major segment change was indicated. Changes of the sort that would require new contained segments could be assessed by looking at the categories which were used as descriptive of aspects of the activity pattern. These changes will be more easily understood after presentation of the Code for Segment Qualities. At this point, examples may suffice: if the teacher changed her role from recitation leader to watcher and helper, but the concern remained arithmetic, there was a beginning of a contained segment; if children's behavior changed from watching a film strip to discussing the issues it presented, a contained segment was marked. A complication in this approach was that sometimes changes occurred that seemed to be a part of the rhythm of one segment rather than a sequence of several segments. For example, a teacher might present a frame or two of the film strip, then engage the group in discussion, then return to the film strip, and so on. These "within-changes could hardly be called segments in the sense intended. To avoid such unitization, the possibility of such internal rhythms was explained and the rule established that a segment must have a stable pattern over time. An activity had to persist for at least two minutes to be marked a separate segment.

One factor which simplified the segmentation problem was that changes did not occur in very small degree or in isolation. Instead, changes tended to be reasonably large and to occur at a number of points simultaneously. For example, the change to reading circle did not involve a spatial change of a few feet but one of going clear across the room; furthermore, changes in population, in behavior objects, and in subject matter (concern) accompanied the location shift.

A related problem is the question of how much behavior unrelated to the pattern of segment can occur before the segment ceases to exist. For example, during an art lesson, there are side-conversations, foolings about with tools, individual inattentions, even teacher digressions. One might ask if these behaviors meant that the segment "art lesson" had dissolved. Most often the answer would be, "No." One may compare an ongoing segment to a game of baseball. If it was observed at a child's game of baseball that the left fielder was inattentive, the shortstop toying with his glove and the first baseman carrying on a conversation with a nonplaying friend, it still could not be said that there was no baseball game. So long as the major performance is carried out; so long as the pitcher pitches, the batter attempts to connect, and the occasionally hit ball gets chased, the game continues. Classroom segments exist as long as their outlines, their identifying patterns persist. The crucial question is not how many behaviors are irrelevant to segment requirements but whether the outline is obliterated by the irrelevant behaviors.

Delineation of Intra-Classroom Action Units: Reliability

All of the third-grade classroom chronicles were segmented by a single analyst over a period of two months. To check the reliability of the method by which the chronicles were unitized, one quarter of a day for each teacher was selected for an extensive agreement check. Samples of chronicle record were chosen so that all periods of the school day would be represented. Two naive workers were given an opportunity to study a set of instructions for segmentation. (See Appendix C for excerpts from these instructions.) Each worker also had about one hour's practice in the segmentation process. Then each worker, independently, unitized the various samples of the chronicles.

One measure of agreement was that proposed by Barker and Wright (1955, p. 271) in their effort to handle a similar problem in checking reliability of episoding. Agreement of portioning of material was estimated by the following formula:

$$\text{Estimate of Accuracy} = \frac{\begin{array}{c}\text{Number of Segments}\\ \text{Discriminated by X}\\ \text{Also Discriminated by Y}\end{array}}{\dfrac{\begin{array}{c}\text{Total}\\ \text{Number of Segments}\\ \text{Discriminated by X}\end{array} + \begin{array}{c}\text{Total}\\ \text{Number of Segments}\\ \text{Discriminated by Y}\end{array}}{2}}$$

where X and Y are independent analysts.

The experienced analyst was compared with each of the naive workers and they were compared with one another. The level of agreement varied according to the analysts, the sections of the chronicles and the criterion for agreement. Agreement can relate to location and content description and also to structure designation of segments. If two analysts marked off the same chronicle span and noted that some type of spelling lesson was involved, this would represent agreement on location and content of segments. Percentages of agreement using these criteria ranged from 67 per cent to 100 per cent; average, 92 per cent. A more stringent criterion demanded that there also be agreement on structure; that is, agreement regarding whether the segment was a major segment alone, a major segment parallel to another, or a contained segment. Agreement for location, content and structure averaged 84 per cent. As might be expected, agreement about major segments was superior to agreement concerning presence or absence of contained ones. The degree of differentiation occurring at the terminals of a contained segment is much less than at the terminals of a major segment.

There is a second way to understand the problem of segmenting reliability: one can ask whether a particular kind of event which occurs more or less continuously is assigned to the same segments by different unitizers. Teacher acts occur in an almost steady stream throughout the school day; one way of deciding if the segmentation is reliable is to ask what proportion of teacher acts are placed in the same segments by different unitizers. (Same means same location, content, and structure designations.) Results for this check are as follows:

Naive workers 1 and 2 included 79 per cent of all teacher acts in the same segments.

Naive worker 1 and experienced unitizer included 80 per cent of these acts in identical segments.

Naive worker 2 and experienced unitizer included 95 per cent of the teacher acts in the same segments.
(The lower agreements involving Naive worker 1 are due to a failure to identify a long seatwork segment. Such a discrimination is, in the real situation, quite easily made; the error with the chronicle would seem to be a clerical or reading error rather than one of judgment.)

An additional bit of information was derived from the work with unitizer agreement. When unitizers marked the boundaries of their segments the marks often fell at somewhat different lines on the typescript, even though it was obvious that the same material was being handled in the same way. For example, Unitizer 1 might begin the Cleaning Up segment a few lines before Unitizer 2. The question was whether significant material such as a teacher act would appear to the unitizers as belonging in the same or different segments. If there was much of this kind of disagreement, it would imply that segments presented vague boundaries; if there was little of such contradiction, one might assume that the beginnings and ends of segments, as these appeared in the chronicles, were sharp and abrupt. Such disagreement was less than 2 per cent. Once segments have been generally identified, their boundaries appear sharply delineated.

Description of Intra-Classroom Units: Segment Qualities

Once segments have been delineated, their description becomes feasible. Certain forms and content of activity persist throughout segments making it appropriate to code these units of the ecology in a fashion analogous to coding units of indivudual behavior. Advantages of such coding go in two directions: (1) Since a classroom day is a structure of segments, coding the segments is a first step toward a quantified description of the total day; (2) once the nature of segments is made clear it becomes feasible to relate variables of student and teacher behavior to ecological contexts, to segments.

Numerous dimensions are relevant to segment description; those which were selected for exploratory work in the present research are outlined briefly below. After this preview of segmental qualities, the actual code is presented.

The concern of segment refers to its major business, to those matters with which it deals. If the concern of a portion of the day is Milk and Story, the classroom environment is rich in the materials and the symbols having to do with drinking and fiction. The segment is concerned with getting people refreshed. Other segments are concerned with academics, still others with ritual, and so forth.

The *teacher leadership pattern* is also a quality that can persist throughout a segment. For some segments the teacher takes no continuing part--as in the Morning Seatwork in Mrs. Hope's class. For other segments, she is continuously the hub of action as when she manages a recitation or dictates a spelling test.

Group qualities are also aspects of the classroom segments. The total class may participate in some segments, smaller groups may engage in others. For some activities, the given action relationships for pupils within the group will be highly interdependent: Games, group singing, and discussions. In other segments the activity requires no interlocking of efforts; in fact, it may be presumed to proceed better without any pupil-pupil interaction; seatwork periods often follow this more private structure.

The *content of pupil activity* is another quality of segments that can be identified in terms of the demands made upon pupil perception and performance. For example, the student simply may be asked to attend and to remember; this is the nature of his activity during the teacher's presentation of a little film strip lecture. On the other hand, the student may continuously perform in the segment; such is the case in drawing, music, physical education, and cleanup segments.

Regardless of the content of the child's activity, there is the matter of its tie to outside stimulation. This is the question of pacing or *action sequencing*. Pupil action in Morning Seatwork is paced by the pupil; action in the usual recitation is paced by an outside stimulator, the teacher. The external-paced segments may require only that the pupils attend and remember; this is the case when the teacher reads a story. The external stimulation may also call for response or a performance by the pupil.

With this overview of the possibilities of describing segment qualities, it is appropriate to present the actual code employed.

Segment Qualities Code

Introductory Instructions

Focus upon events in the main body of the segment rather than beginnings and ends. Consider the segment's intrinsic type as well as details of pupil or teacher behavior. For example, a segment might be "Teacher Reads Story"; it could happen that things went badly. There was much reprimanding, there was subrosa horseplay; some children paid little attention to the external pacing (teacher reading). The coding should still represent the outline of the segment structure, not the behaviors contrary to this structure. Of course, if things deteriorate so that the outline of the segment dissolves, code the action that exists, not that which is supposed to be, but isn't.

At various points, the category *other* appears. This alternative is to be used when the coder feels that use of the specific given codes would seriously misrepresent the nature of the segment.

Although the labels given to the segments are often suitable for their purpose, they should not be used as a basis for coding. For example, a segment may be labelled "Instruction for Seatwork" but the teacher may utilize a recitational rather than an instructional pattern; code Instructor on Teacher Leadership.

Concern Refers to the classes of endeavors, of concerns, most clearly represented in the segment. With what issue does behavior en masse deal? Segments do not have goals, but they have facilities by which individual purposes can be both stimulated and satisfied.

Academic	1.	Reading	Children's reading groups; phonics and word meaning study
	2.	Arithmetic	
	3.	Language	Grammar, creative writing, handwriting
	4.	Social Studies	Geography, current events in Weekly Reader
	5.	Science	All types except incidental content in Weekly Reader
	6.	Mixed or Other Academic	Seatwork is often mixed. In case of doubt, assume mixed
Arts	7.	Ritual	Flag salute, prayer and song
	8.	Music	Listening or making or both
	9.	Art, Crafts	Any making of pictures, objects
	10.	Other Art	
Social and Recreational	11.	Sharing	Show and Tell, or just Tell
	12.	Milk and Story	Teacher reads, children drink and listen.
	13.	Story	No milk
	14.	Milk	No story
	15.	"Fun" Games	Not academic
	16.	Rest	Explicit rest time, not just waiting
	17.	Other	Social, recreational activities not given above
Procedural	18.	Transition-In	Return from: recess, lunch, home
	19.	Transition-Out	Go to: recess, lunch, home
	20.	Other Procedural	Milk money, etc.
	21.	Other-Other	Fits none of the given areas, e.g., teacher devotes whole segment to group's discussion of why recess went badly.

Teacher Leadership Pattern

Describes the basic, persistent pattern of the teacher's relationship to the maintenance of the segment.

Teacher (T)

1. Not in Segment	T not helping, not clearly and consistently attending to segment. T not key to pupil action. T usually busy in another segment.
2. Watcher-Helper	T is with this working group; clearly watching over them or helping them. May circulate, stand at back; may even be at desk but if at desk, is at least periodically involved in segment affairs.
3. Participator	T may sing with, salute with. Code when T is not leading but participates along with students.
4. Action Director	T gives directions for cleanup, orders to manage activity, leads a song, acts as master of ceremonies. T is key to action, is making demands for doing, but she is not supplying the core action.
5. Recitation Leader	T asks for reciters, comments on answers, may quiz.
6. Instructor	T tells pupils how to make something, what facts are, etc. Does not use recitation format to do this. Does not ask for contributions from pupils to any degree. May answer pupil questions; may question pupils briefly to check them out but this is clearly less than half her effort.
7. Reader	T reads to pupils.
8. Tester	Usually T will give questions orally, but she doesn't have to do this. Could point children to a test they have on their desk. T could give test and function like a proctor. Logically this last should be coded "Watch" but to keep all testing together, T-supervised testing is coded "Tester."

Group Quality

Refers to two ideas: whether class functions as one group or in subgroups; whether pupils' actions are to be interdependent (as in a game or discussion), private, or not particularly one or the other.

Total Group	1. Class/Interdependent	Pupils listen to and respond to the actions of one another, e.g., recitation, singing, all listen together to story, etc.
	2. Class/Private	Pupils attend to own affairs; not observe or respond to behavior of one another. En masse testing, rest and seatwork are often of this type. Non-awareness of, nonreaction to the other person is the most suitable orientation.
	3. Class/Neither Interdependent nor Private	Pupils do a number of different things. Neither "togetherness" nor privacy is clearly the action relationship built into the segment, e.g., getting ready to go home or getting ready to start day.
Subgroup	4. Class/Sectioned	Pupils divided into groups but total class is run by T as unit, e.g., four groups of students around four tables of equipment--but all do same thing, all are parts of total class lesson.
	5. Group/Interdependent	Pupils in a group of face-to-face size. They are to listen to and respond to the action of one another, e.g., reading circle group.
	6. Group/Private	Pupils' groups less than class size but are not to work together, e.g., some seatwork segments.
	7. Group/Neither Interdependent nor Private	Pupils' groups less than class size but are not supposed to be especially private or other-oriented.

Pupil Activity

Activity may be described on the basis of its perceptual and its accomplishment demands. In seatwork, a pupil is asked to narrow his perceptual span to his own materials; in a class discussion he attends to teacher and classmates, a wider perceptual field. These perceptual differences have been indicated in the code below as Own Materials/Attend vs. Class Events/Attend. (The word class in this context implies either total class or a group acting as a class.)

On the accomplishment side, activity may require that one attend, incorporate, or think about presented stimuli but pose no task; one doesn't have to "do" anything. Listening to a story or a discussion are examples. On the other hand, some activity invites or requires task accomplishment: filling in blanks or writing a story. The distinction is represented in the code by the words Attend vs. Task.

Some tasks are more active than others; separate categories have been established for activity beyond writing or making computations. These are listed below as Draw and Make, Sing, Chant, Play Instruments, Large Muscle Activity and Readying. The attention distinction was judged less crucial for these highly active categories. However, the direction of attention consideration applies to some of the other categories: attention is on own affairs in Rest and in Draw/Make; it is more widely directed in Sing, Chant, Play Instruments.

1. Rest	Pupils reduce both attention and accomplishment to minimum.
2. Own Materials Attend	Pupils read stories at their desk, study the Weekly Reader.
3. Own Materials Task	Pupils write or compute.
4. Class Events Attend	Pupils attend to an arena much wider than own books and papers. No task. (Pupils may have a turn to recite. This is represented as a "performance" on the Action Sequencing code which follows. It is not represented as a task here.)
5. Class Events Task	Pupils attend to wider arena and have ongoing task to accomplish. Class may finish individual worksheets by alternating writing of answers with discussion of obtained answers.
6. Draw/Make	Pupils create products: drawings, paintings, paper objects.
7. Sing, Chant, Play Instruments	Pupils engage in group singing, ritual chants, playing of flutophones.
8. Large Muscle Activity	Pupils exercise, play active game, dance, pantomime.
9. Readying	Pupils prepare selves and props for beginning or ending of phase of school (Cleanup Time).

Action Sequencing

The basic consideration refers to pacing: whether behavior is self-paced or is prodded by external stimuli. The perceptual and the action aspects of behavior are relevant. In a self-paced action, both the intake and the motoric qualities must be such as to permit the subject to behave at his own speed and readiness. Reading a book is a self-paced behavior; watching a movie is not self-paced since the perceptual or intake speed is determined by the movie, not the observer.

Thus, activity may be externally paced in that the behaver must keep perceptually abreast of a changing or developing field. Beyond this, an activity can be externally paced in that tasks must be executed on external cue. An oral test is usually externally paced in both the perceptual and the performance sense.

0.	No Pace	Rest
1.	Self Pace	Pupils follow material and execute tasks (if any) as own readiness dictates, e.g., filling out a worksheet during seatwork; silently reading a short story.
2.	Self Pace/ Towards a Turn	Pupils prepare on their own, but at the end of a cycle, they use preparation for a "turn" to leave, to answer, etc., e.g., cleaning up one's area in order to leave.
3.	External Pace/ No Performance	Pupils "take in" at the pace of the emitters, e.g., following a film strip presentation or a lecture. No other overt tasks are involved.
4.	External Pace/ Serial Performance	Pupils follow developments perceptually and occasionally contribute [illegible] of [illegible], e.g., engaging in a recitation.
5.	External Pace/ Mass Performance	Pupils follow developments and contribute at the same time, e.g., singing, playing continuous action games like tag or basketball, group exercises.

Reliability of segmental coding was assessed by comparing the number of similar judgments made by independent coders with the total number of judgments required. Thus, a first reliability check of the finished code involved 30 segments selected from among all teachers and all parts of the day. Since there were five sets of categories to be applied to each segment 150 decisions were required. Agreement regarding 133 decisions yielded a reliability of 89 per cent. A second check, with fifteen new segments, yielded 93 per cent agreement.

A final statement regarding segments seems appropriate: Segments (not teachers, pupils, or their behavior) became the basic, focal units of this research. Each segment was represented by an IBM card. Data with regard to a segment's identity, its ending on all category sets, its duration, its link to other segments were punched on the card. Beyond this, certain data regarding teacher and pupil behavior in that segment were also entered; thus exploration of relationships between segment qualities and participant behaviors was facilitated.

Teacher Behaviors Code

The chronicles which served as primary data for the delineation and description of segments could be employed in another fashion. The chronicles were built around teacher activity, they were modified specimen records of teacher behavior. Therefore, it was possible to describe the teacher's activity as she established and lived in the various segments of the school day. Teaching behavior was unitized into acts*; the content and target of these acts were specified.

Content Code

Schemes for the systematic description of teacher behavior are the outgrowth of particular interests and orientations of their inventors. The present researcher was curious about the way in which the teacher initiated, sustained, and terminated the activities of the day; the categories of the coding system reflect this aspect of teacher behavior. Nuances relating to social-emotional aspects of teacher behavior, or to distinctions regarding intellectual challenges in teacher questions are not captured by the code. The coding development began with the conception that the acts which teachers directed towards pupils could be logically divided among the following behavioral efforts: directing pupil behavior, giving pupils information, seeking information from pupils, and other categories. This organization proved useful for entering teacher acts into dependable categories; it was necessary later to collapse the categories into different clusters in order to yield a sensible portrayal of the teachers' activity.

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*An act was the smallest meaningful input to students. Acts changed when the message changed or the target changed. Teaching acts, as conceived here, are similar to "moves" in game; they are designed to advance or to protect an activity. The following illustration shows a series of four acts:

"All right, children, let's see how sharp we are today. / Open your books to page 19. / Who remembers what it was that Jane was trying to do? / (Pause) George?" /

The sense of the code may be carried by a listing of the major categories with examples:

Directions to Pupils

Recitation Questions:	"Class, who was our second President?"
Academic Task Assignment:	"Draw a heart, something like this one."
Job Assignment:	"Mary, will you lead the salute?"
Prop Readiness:	"Get out your spellers."
Prop Distribution:	"Let's pass these papers on around."
Prop Away:	"Put your pencils in your desks."
Pupil Housekeeping:	"Pick up all paper around your desk."
Movement:	"Elmer's Group, come back here now."
Limited Movement:	"Stand up."
Attention Change:	"Now, let's look at this board a minute."
Limited Attention Change:	"Notice the two vowels in these words."
Stance Improvement:	"Let's be careful now."
Energy Output Improvement:	"You'll have to work faster."
Behavior Counter:	[illegible]
Behavior Negation:	"Don't do that!"
Contribution Correct:	"That's a good answer."
Contribution Incorrect:	"That's not the way it works, Johnny."
Permission Grant:	"Yes, sharpen it now."
Starts and Stops:	"It's time to stop our lesson."

Giving Pupils Information

Knowledge:	"Milk is mostly water."
Appreciation:	Teacher reads a poem.
Orientation:	"This afternoon we'll have time for mo reports."
Social Knowledge: (Re Pupils, Teachers, and their associates)	"Tony's father has just come back from a long trip."

Seeking Information from Pupils

Activity Desire:	"What songs would you like to sing?"
Role Desire:	"Who would like to handle the poster-making?"
Work Status:	"How many are finished?"

Other Categories

Amenities:	"Good morning, boys and girls!"
Individual Problems:	Teacher responds to an individual so quietly that the observer did not hear the content. The context of these interactions usually suggested that the teacher was giving help on, or at least giving ear to, individual problems.

Collapsed Content Code

The above categories were clustered into different patterns once the data had been coded; this was because it seemed sensible to group together acts which had to do with similar functions; thus acts relating to instruction were grouped regardless of whether they were directive, information giving, or information seeking. Clusters and subclusters employed in data summaries were as follows:

TEACHING

- Recitation Questions
- Feedback (Contributions Correct, Incorrect)
- Imparting Knowledge, Appreciation
- Work Status Questions

STRUCTURING THE BEHAVIOR AND BEHAVIOR OBJECT PATTERN

- Movement of Behavior Objects and Pupils
- Structure (Task Assignment, Orientation)
- Attention Changes (and Action Starts and Stops)
- Information Seeking (re: Activity and Role Desires)

DEALING WITH DEVIATING BEHAVIOR

- Stance, Energy Improvement
- Countering
- Permission

OTHER ACTS

- Individual Problems
- Amenities and Miscellaneous

Target Code

The objects of teacher acts were coded by applying the following categories:

Targets in Group Led by Teacher

- Total Class
- Group (Streets and Roads Reading Group)
- Part (Non-Interdependent Group; e.g. Row #1)
- Individual-Public (Pupil called upon to recite)
- Individual-Private (Pupil dealt with as an individual, not group member)

Targets in Group Not Led by Teacher

- Entire Outgroup
- Individuals in Outgroup

Targets not Class Members

- Messengers, Observers, Visitors, etc.

Reliability

Reliability of aspects of the Teacher Code was estimated by determining the extent to which independent coders applied the same designations to teacher acts.

Agreement in placement in one of the 28 Qualities Categories was 74 per cent.

Agreement in placement in one of the 13 subclusters used to present data was 81 per cent.

Agreement regarding placement in one of the 4 major clusters (Teaching, Structuring Behavior and Behavior Objects, Dealing with Deviating Behavior, or Other) was 88 per cent.

Agreement for targets was 96 per cent.

Pupil Behaviors Code

Material available for the assessment of pupil behavior during the sequence of the day's segments came from 16mm. movie film. (See pages 17-18.) Coders viewed a projection of a still shot of the classroom and categorized the behavior of the 14 to 16 most visible students; an equal number of boys and girls were used as subjects. Shots were available for every twenty seconds of the school day. In cases of segments over 10 minutes in length, every third shot was actually coded. Coders followed film events with the relevant chronicle material. Thus they were aware of the total classroom activity at all times. Particularly, they knew from chronicle statements what pupils were supposed to be doing at the time of the film shot. If a pupil was out of his seat and it was known to be a transition period, this behavior had a different meaning--and was coded differently--than if it occurred in the middle of a study session.

The code employed was designed to cover two issues: To what extent is the pupil involved in the core, legitimate activity of the segment? To what extent does the pupil engage in resting and self-touching behaviors?

The actual code is reproduced below.

Involvement

Definitely In:	Pupil is seen doing as he is expected to do. He attends to the book he should be studying, he listens to the teacher explanation, etc.
Definitely Out:	Pupil is seen to attend to that which is not his legitimate interest. Orients to friends during recitation, etc.
Probably In:	Pupil not attending to illegitimate objects but attention to the legitimate is not clear either. Often used when pupil partially obscured.

Resting-Touching

Resting:	Pupil slumping, propping himself up, trunk is not bearing own weight, weary.
Self-Touching:	Pupil fingers face, pulls hair, scratches, caresses arm, etc. Pupil must be actively touching self, not, for example, resting one hand on the other.

Three workers shared the task of rating the pictures. Agreement checks were interspersed through the rating tasks. These reliability measures yielded the following:

Rater 1 and Rater 2 agreed on 86 per cent of the decisions.

Rater 1 and Rater 3 agreed on 86 per cent of the decisions.

Rater 2 and Rater 3 agreed on 89 per cent of the decisions.

The adequacy of the photographic approach can also be assessed by estimates of the extent to which it creates behavior. It will be recalled that camera watching by fourth-grade children in the summer school was fairly extensive; 7.5 per cent. (See page 12.) Fortunately, the evidence available from the present study shows a minimum number of frames in which pupils directed attention to the camera or the observer, four-tenths of one per cent.

The scope and measurement efforts of the Major Study can be summarized as follows:

1. Activity on two days in six third-grade classrooms was observed and recorded in chronicles.

2. The chronicle of each day was unitized into extra-individual activity units, or segments.

3. Segments were described in terms of their:

   Concern (Business)
   Teacher Leadership Pattern
   Grouping Arrangement
   Pupil Activity
   Action Sequencing

4. Teacher behavior was described in terms of target (individuals or groups) and following content clusters:

   Teaching
   Structuring the Behavior and Behavior Object Pattern
   Dealing with Deviating Behavior
   Other

5. Pupil behavior was described in terms of:

   Involvement in Prescribed Activity
   Presence of Self-Touching and Resting Behaviors

The purposes of the investigation were:

- to describe classroom environments in segment terms
- to relate this segment description to aspects of teacher and pupil behavior

RESULTS

When the methodology just described is applied to the primary data, two types of description become available.

First, a quantified picture of the classroom days may be made in terms of segment measurement: number of major segments, extent of simultaneous segments, and prominence of segments showing various qualities.

Secondly, the analysis may go beyond simple statement of segment values to explorations of the relations between segment variables and variables descriptive of teacher and pupil behavior.

Classroom Environments as Segment Constellations

In the pages to follow, sets of purely descriptive data will be presented. Hopefully, such reporting will illustrate the measurement possibilities in segment analysis. Further, since the classes were chosen to represent a range of situations within relatively traditional third grade classrooms, the data can serve as comparison points for future studies of classroom structure.

Structural Characteristics

Segments represent the internal activity units of the classroom day. They may operate one at a time, or simultaneously (parallel segments); furthermore, a large segment may contain several smaller segments within it. Such structural properties have been more fully described on page 18 of this account. A total of 374 segments were obtained for the six teachers over the two days each of observation. Central tendencies and variabilities regarding the number of segments, and the extent of contained and parallel segments are displayed in Table 2.

Table 2. Measurements Relating to Segment Organization of the Classroom Day

	Mean for All Six Classes*	Mean Difference between Classes	Mean Difference within Classes*
Number of Major Segments	20	1.45	.75
Number of Contained Segments	11	2.17	1.67
Per Cent of Days' Time in which Parallel (Simultaneous) Segments Operated	35	8	3

*Chronicles were made for each class on two separate Wednesdays. Mean difference within classes is based upon one-half of the difference between one Wednesday and the next. In terms of operations, then, the "within classes" measure is a between days of the same class" measure.

The number of major segments established in the third grade classroom averaged 21. Variation between classes around this mean is quite slight, 1.45 segments. Nor did individual classes vary much from day to day; within classes variation averaged less than one segment per day. It may be that the general demands of the prescribed curriculum interacting with the limited time available in one day hold the number of major segments to a relatively constant number.

Contained segments average 11 per day; variation between and within classes was slightly greater than for major segments, but was still not extensive; 2.17 and 1.67 segments, respectively.

The third set of information on Table 2 refers to parallel or simultaneous segment structure; for about one-third of the classroom day, two arenas operated at once; put another way, about two-thirds of the day, the structure was an en masse arrangement, all pupils occupied the same activity environment.

Classes showed some variation in the per cent of time during which double segments were maintained; the average deviation between classes is 8 per cent, and this is much greater than the 3 per cent variability within classes. (When these two variability measures are compared in a test for nonrelated means, the resulting p is $> .001$)

Apparently the extent to which a teacher doubles up her organization will show reliable teacher-teacher differences. Almost all of the simultaneous segments involved some pupils studying in seatwork in one segment and the teacher directly dealing with the remainder in the parallel segments.

Quality Characteristics

Description of the classroom environment can now proceed from matters of structure to those of content. The questions are: What sort of things go on in the classroom? Which aspects of activity are prominent, and which are of minor significance? These questions may be answered using the Code for Segment Qualities described on pages 24-31.

The prominence of environmental qualities may be represented in several fashions; the amount of time the segment quality persisted or the number of segments which showed the quality are two possibilities. The index that appeared most suitable for these data was pupil occupancy time; this index reveals the proportion of all pupil time spent in segments of interest. If there are 30 pupils and a 5-hour day, then there are 150 hours of total pupil occupancy time. If 12 of these students spend half an hour in a segment with the concern art, the occupancy time for the art concern is 6 hours. The per cent of occupancy time devoted to art is 6/150 or 4 per cent. The occupancy time index, then, reflects the importance of a particular quality by stating the per cent of total pupil time allocated to segments exhibiting that quality. The occupancy time measure seems superior to duration of a segment because occupancy reflects the number of participants to an action as well as its length. It would be possible for segments of a certain type to have relatively long duration, but few inhabitants; a duration measure would overstate their importance in the life of the total class.

The reader will recall that analysis of segments involved the following:

(a) Five areas of category sets, Concern, Teacher Leadership, Grouping Arrangements, Pupil Activity, Action Sequencing.
(b) Number of categories within each set.

Concern

The first category set for which segments are coded was *concern*; this code asked: "With what matters did the segment deal?" Segments were concerned with the following general areas: Academic subject matter, music and art, social and recreational activities, and procedural issues. The relative importance of these various concern clusters is represented in Table 3. A total of 99,797 minutes of pupil time is involved in the following percentages.

Table 3. Per Cents of Pupil Occupancy Time Devoted to Segments of Various Concerns

Concern of Segment	Mean Per Cent of Pupil O.T.	Mean Difference between Classes	Mean Difference within Classes
Academic	71.8	6.0	4.3
Reading	10.3	1.9	0.9
Arithmetic	10.8	4.3	0.7
Language	12.4	2.8	1.9
Social Studies & Science	7.1	4.3	3.1
Mixed	31.2	6.1	3.2
Artistic (Music, Art)	6.7	4.2	3.4
Relaxation-Social	9.4	5.2	2.4
Milk, Story, Rest.	5.0	1.9	0.7
Others (Ritual, Sharing, Games)	4.4	3.3	1.7
Procedural	11.8	2.8	0.9

Inspection of Table 3 shows that most pupil time, 72 per cent, went into segments whose concern was some kind of academic involvement. The largest single subcategory was mixed, a designation which applied to most seatwork structures during which pupils worked on several subjects. It may be of some significance that the between classes as well as within classes variabilities were lowest for reading; it is as if the everyday maintenance of this activity was accepted by all teachers as necessary.

The data for artistic segments indicates that the consistency of these offerings was quite low; given a mean of only about 7 per cent occupancy time, between-classroom variability was 4 per cent. Inspection of the primary data revealed that one classroom averaged 13 per cent over the two days while another averaged less than 2 per cent.

Variability was also extensive in the Relaxation-Social cluster; mean between classes variation is 5 per cent. However, the Milk, Story, Rest type of segment had a very steady place in the day; variability between classes was only 2 per cent, within classrooms less than one per cent.

Procedural segments occupied almost 12 per cent of the pupils' time; classrooms did not differ greatly, on the average almost 3 per cent; however, variations within classrooms was quite low, about one per cent. In assessing classroom efficiency the amount of pupil time devoted to procedural matters may be of some significance. One could take the position that procedural time is a pedagogical cost rather than a dividend since it represents time not devoted to valued pursuits but to transitions into and out of the classroom.

Teacher Leadership

The environments for pupils may also be described in terms of the action role assumed by the teacher. The prominence of various teacher leadership patterns appears in Table 4.

Table 4. Per Cent of Pupil Occupancy Time Devoted to Segments of Various Teacher Leadership Patterns

Leadership Pattern of Segment	Mean of Pupil Occupancy Time	Mean Difference between Classes	Mean Difference within Classes
Minimal Leadership	39.9	5.2	2.4
Teacher Not in Segment	22.5	3.4	3.3
Watcher-Helper	17.2	6.3	2.3
Participator	0.2	0.2	0.1
Active Leadership	60.0	5.3	2.3
Action Director	23.1	6.6	4.3
Recitation Leader	27.8	7.8	2.5
Instructor	3.2	1.6	1.3
Reader	3.1	1.9	0.9
Tester	2.7	2.2	1.1

The dimension of intensity of teacher ongoing leadership has been employed on Table 4 as an aid in organizing the categories. Clearly, the least leadership is Teacher Not in Segment--a designation which means that the teacher is busy elsewhere in the room and children are for the time, on their own. Pupils invested 22.5 per cent of their time in such segments. The dependence of most pupils upon ongoing teacher behavior is also low if she functions as Watcher-Helper. Pupils spent on the average of 17 per cent of their time in such activities. The between-teacher variability is rather high for this pattern, 6 per cent. In all, 40 per cent of pupil occupancy time goes to activities in which teacher leadership is minimal. On the other hand, the more common patterns are those in which the cuing and/or the content of action is highly teacher-dependent. The teacher functioned as Action Director in segments which required 23 per cent of the pupils' time. She operated as Recitation Leader even more extensively, occupancy time here was 28 per cent. Both Action Director and Recitation Leader patterns involve relatively high pupil activity; in these segments the teacher continually calls for pupil action. In the sense of high pupil activity, the Tester category belongs with this same group. Here also the teacher leadership is not one of instilling knowledge, but the persistent cuing of action. The Action Director, Recitation and Tester categories together occupied just over half of the pupils' segment time (53.6 per cent). The Instructor and Reader categories represented about 6.5 per cent of the pupils' time; in these forms, the teacher's leadership provides material for incorporation, but opportunities for pupil activity are relatively low. The Reader pattern most usually provides pupil entertainment. In the Instructor pattern the teacher presents facts or techniques which the pupils are to learn. Both the Reader and Instructor leadership present teacher-pupil relations in which the teacher expounds and the pupil absorbs; such segments were clearly _not_ prominent in these third grade classrooms.

Group Arrangements

Categories under the heading of Group Arrangements reflect two dimensions: extent to which the class is divided or kept whole and extent to which the activity requires interdependent versus independent orientations and behaviors. Although logically distinct, these two dimensions combine in reality to form a more basic continuum which can be labelled, Support to Social Contact. The reading circle, classified as Group/Interdependent, shows the combination of the two end points on basic dimensions to form a structure high in face-to-face interdependence; this activity is interdependent in format (recitation, taking turns, discussion, sharing, etc.) and by virtue of including only a part of the class becomes an especially face-to-face, or intimate, assembly. At the opposite extreme, there is the Class/Private arrangement in which pupils engage in individual study. Here the format asks participants to avoid attention to others and to prevent their own behavior from intruding upon others. This grouping tends to be large, the whole class, and thus lessens further opportunity for social contact. Intermediate on the Support to Social Contact dimension are the Group/Neither Independent nor Private and Class/Neither Independent nor Private segments. In these structures, no effort is made to keep one pupil's behavior out of the attention of another; partial activity interdependence also exists: students take on helper roles or groups take turns in dealing with wraps or in leaving the room.

The extent to which pupils spend time in environments of these various types is shown in Table 5.

Table 5. Per Cent of Pupil Occupancy Time Devoted to Segments with Various Grouping Arrangements

Grouping Arrangements	Mean of Pupil Occupancy Time	Mean Difference between Classes	Mean Difference within Classes
Interdependent	49.5	7.4	6.6
Group	11.5	3.1	0.9
Class	38.2	5.7	7.0
Neither Interdependent nor private	15.2	4.6	3.4
Group	1.5	2.4	1.4
Class	13.7	4.0	4.7
Private	32.8	5.8	6.6
Group	21.4	5.7	4.9
Class	11.3	6.2	4.1
Class/Sectioned	2.2	1.8	1.7

From Table 5 it is clear that pupils spend only a small fraction of their time, 11 per cent, in the most face-to-face, interactive segments. Such segments were operative 27 per cent of the total duration time, but since they involved only a minority of students at any one cycle, the time each student spent in them was limited. The amount of time in the interactive but en masse situations was much larger, 38 per cent. Students in these conventional classrooms spent almost half of their time in formats which are interdependent, the occupancy time in Group and Class/Interdependent segments was 49.5 per cent. In contrast, only about a third of pupil occupancy time was spent in private endeavor, Group/Private was 21 per cent and Class/Private was 10 per cent.

If these classes can be taken as representative, it appears that third grade classrooms are socially interdependent affairs. Introduction of automated and programmed learning might sharply reduce this sociality. Whether children are more comfortable and/or better motivated in the less social classroom environments is an interesting issue.

Pupil Activity

Consideration may now turn to what the pupil is asked to do in the various segments he inhabits. The Pupil Activity code dealt with pupil action in terms of the scope of the perceptual demand and the task quality of required behavior. Thus, reading a book is an activity narrow in perceptual scope and without an external task; constructing a table of imports and exports under a teacher's blackboard demonstrations involved wider perceptual scope and task accomplishment. When behavior was more active than the writing of words and figures, special categories were used. These active segments were: Draw/Make, Sing,Chant,Play Instruments, Large Muscle Activity, and Readying.

Results of the Pupil Activity analysis appear in Table 6.

Table 6. Per Cent of Occupancy Time Devoted
to Segments with Various Pupil Activity

Pupil Activity	Mean of Pupil Occupancy Time	Mean Difference between Classes	Mean Difference within Classes
Restricted Attention	39.3	5.3	3.1
Rest	0.8	0.6	0.5
Own Materials/Attend	0.2	0.2	0.2
Own Materials/Task	35.6	4.9	3.3
Draw/Make	2.8	2.3	2.1
Broad Attention	49.9	7.3	3.5
Class Events/Attend	36.7	7.7	4.0
Class Events/Task	9.8	4.3	3.5
Sing,Chant,Play Instr	3.5	1.3	2.1
Large Muscle Activity	1.2	0.7	0.6
Readying	9.3	2.2	1.3

Pupils occupied segments which called for attention to one's own props and problems about 39 per cent of the time. Clear demand for attention of wide scope occurred in 50 per cent of the occupancy time. The remainder of the occupancy time was spent in segments where attention was sometimes to class-wide events, at other times to the pupils' own materials and tasks (Large Muscle and Readying). On the whole, a picture emerges of more time spent in activity requiring class-wide (or Group) orientation than the opposite.

Turning to the performance side of the Pupil Activity, it may be asked, how much does the child get to do in class, as opposed to simpl watch and listen.

The categories in Table 6 can be considered along a dimension of the extent of physical activity required for segment performances. Th very low activity categories are Rest and Own Materials/Attend; occupancy time in these categories was a negligible one per cent. However, in the segments coded Class Events/Attend pupils simply watched and listened most of the time; they did nothing except for occasional recitations. The activity here, then, was moderately low; yet such segments required 37 per cent of the pupils' time. Somewhere near Class Events/Attend, along the physical activity dimension, is Own Materials/Task. Pupil activity here is modest, writing of words and figures interspersed with reading and thinking. These segments took up 36 per cent of a pupil's time. The total per cent occupancy time of all of the low and moderately low physical action segments was 73 per cent. Those segments which ask a child to "do something" in the sense of continuous, overt physical activity were much less prominent than those which asked for a more passive, covert, or intermittent child action.

Action Sequencing

When the results of Action Sequencing investigation are inspected, the main issue deals with pacing. The question is: Within the boundaries of the segment, does the pupil perform segment actions in response to an external pacer or does he rely upon his own timing? Self Pacing connotes more pupil freedom than is intended; it should not be taken to mean that the beginning and ending of the segment's general effort is up to the student. In the classrooms studied, these matters were set by the teacher. Self Pacing means that the pupils determined timing of attention and efforts within the segment's limits. As an example, self paced behavior could occur during seatwork when pupils wrote out answers to questions at the end of a text chapter.

Externally paced structures probably tend to pull participants along; if tasks as well as attention are periodically required, externally paced structures should tend to prevent prolonged noninvolvement in the segment's business.

The prominence of various pacing arrangements is displayed in Table 7.

Table 7. Per Cent of Pupil Occupancy Time Devoted to Segments of Various Action Sequencing

Action Sequencing	Mean of Pupil Occupancy Time	Mean Difference between Classes	Mean Difference within Classes
No Pace (Usually Resting)	0.8	0.8	0.4
Self Pace	40.8	5.8	4.0
Self Pace/ Towards a Turn	7.1	1.6	1.2
External Pace/ No Performance	9.6	3.1	2.2
External Pace/ Serial Performance	37.9	7.0	2.4
External Pace/ Mass Performance	3.9	1.9	2.0

A general dimension of external push to action runs through the categories as they are ordered on Table 7. The No Pace category represents the least possible external guide and prod to behavior while the External Pace/Mass Performance represents the most thorough outside timing of attentions and efforts. Distribution of occupancy time along this dimension did not follow the normal curve, but tended to be bimodal. For example, the low points, No Pace and Self Pace, required 42 per cent of the occupancy time. The Self Pace/Towards a Turn can be considered more intermediate in external control since the turns provide periodic action demands. Also, it would appear that External Pace/No Performance is somewhat intermediate along the external push dimension because these structures provide external attention demanders but no periodic task accomplishment. These intermediate categories required only 17 per cent of the pupil occupancy time. External Pacing with Serial Performances and External Pacing with Mass Performances are highest in the external push dimensions and these total 42 per cent of the occupancy time. To summarize, the occupancy time percentages for categories designated as low, intermediate, and high in external push to action ran 42 per cent, 17 per cent and 42 per cent.

Common Segment Patterns

Description of the classrooms to this point has considered segments in terms of one set of dimensions and then another. Now all sets of dimensions will be inspected simultaneously. The questions are : What are typical patterns of segment qualities? What patterns are conspicuous by their absence?

A pattern is described by stating, in a sequence or list, the coded qualities of a segment. One segment was coded as follows:

Category Set	Category
Concern	Music
Teacher Leadership	Action Director
Group Arrangements	Class/Interdependent
Pupil Activity	Sing, Chant, Play Instruments
Action Sequencing	External Pacing/Mass Performances

The number of patterns logically possible is the number of categories in set one (Concern) multiplied by the number in set two (Teacher Leadership) and so on; therefore there are, logically, 53,235 possibilities. This number is sufficiently large to permit every one of the 374 segments to have a different pattern. However, several factors markedly reduced this potential variety. Segments were often repeated. Teachers ran exactly the same segment on the second observational day as they ran on the first. Different teachers presented identical segments. Secondly, although the category sets are logically distinct, they are highly interdependent in reality. The existence of a particular code on one category set may predict the coding on remaining sets. The Concern code Music was made for 13 segments; 11 of these were coded on the remaining sets as indicated in the example above.

Other Concern codings showed less complete but still appreciable associations with other sets. Of 29 segments coded Arithmetic for Concern, 13 received a Teacher Leadership classification of Recitation Leader. Association between category sets beyond Concern was also extensive. A coding of Teacher Not in Segment was likely to be coded on Grouping Arrangements as Group/Private.

Since many segment patterns are repeated and since a code in one category set is likely to predict one in another, it is possible to represent a sizeable proportion of the classroom environments with relatively few segment constellations. In Table 8 are listed those segment patterns which accounted for over 2 per cent of pupil occupancy time.

From Table 8 it is clear that the segment type with the greatest occupancy time was one in which the teacher was absent. Students worked privately on a variety of academic tasks, attended to their own materials, and proceeded at their own pace. Since there was a total of 99,797 minutes occupancy time, this one pattern of 20,606 minutes accounted for over one-fifth of all the time students spent in the classroom. The segment pattern with second most occupancy time, and most frequent occurrence, was the reading circle. This format appears on Table 8 with teacher as Recitation Leader, Group/Interdependent Attend Class Events, and External Pacing/Serial Performances. A very similar pattern appears last in Table 8; the only difference is that the teacher functioned as an Action Director (who called on pupils to read) rather than as Recitation Leader (who urged exchange of ideas and knowledge).

These two reading circle patterns combined accounted for 83 of the 374 segments and 8,680 minutes (9 per cent) of the occupancy time. The third most frequent pattern, and the one taking up the third most occupancy time, is the one beginning with Transition Out. The amount of time devoted to procedural efforts has already been discussed. The pattern here refers simply to closing down class operations and leaving the room; this process takes its toll in occupancy time.

The fourteen patterns listed in Table 8 account for 51 per cent of the segments and 61 per cent of the occupancy time. Obviously, there is much repetition of segment environments.

Action Structure

The redundancy of segmental attributes appears even more impressive if one limits distinctions to those which describe the basic action structure of the segment. These distinctions refer to the major qualities of teacher action, the nature of pupil activity, the sequencing of action and the interdependency (or lack of it) of pupil association. Concern is not considered part of the action structure but a quality which can utilize a variety of structures. Teacher activity can be assigned to the following clusters:

Minimal Leadership:	1. Not in Segment
Overseer Leadership:	2. Watcher and Helper
Central Leadership:	3. Action Director and Recitation Leader
	4. Instructor and Reader
	5. Action Director (in Transition Out)

Table 8. Segment Patterns Accounting for Pupil Occupancy Times of More than Two Per Cent of Total

Concern	Teacher Leadership	Grouping Arrange	Pupil Activity	Action Sequencing	Number of Segments	Total Occupancy Time of Segments (minutes)
Mixed Academ	Not in Segment	Group Private	Own Matrl Task	Self Pace	14	20,606
Read	Recit Leader	Group Interdep	Cls Evnts Attend	Ext Pace Serial Perform	62	6,644
Transit Out	Action Director	Class/Not Interdep or Private	Readying	Self Pace to Turn	40	6,456
Mixed Academ	Watcher-Helper	Class Private	Own Matrl Task	Self Pace	4	3,997
Lang	Recit Leader	Class Interdep	Cls Evnts Attend	Ext Pace Serial Perform	5	2,924
Mixed Academ	Recit Leader	Class Interdep	Cls Evnts Attend	Ext Pace Serial Perform	7	2,617
Music	Action Director	Class Interdep	Sing, Chant, Play Instruments	Ext Pace Mass Perform	9	2,439
Social Studies	Recit Leader	Class Interdep	Cls Evnts Attend	Ext Pace Serial Perform	5	2,399
Arith	Recit Leader	Class Interdep	Cls Evnts Attend	Ext Pace Serial Perform	5	2,351
Lang	Watcher-Helper	Class Private	Own Matrl Task	Self Pace	4	2,284
Lang	Tester	Class Private	Cls Evnts Task	Ext Pace No Perform	5	2,157
Science	Recit Leader	Class Interdep	Cls Evnts Attend	Ext Pace Serial Perform	5	2,148
Milk Story	Reader	Class Interdep	Cls Evnts Attend	Ext Pace No Perform	6	2,126
Reading	Action Director	Group Interdep	Cls Evnts Attend	Ext Pace Serial Perform	21	2,036

When distinctions are limited as described, the number of frequently employed basic action structures turns out to be quite limited. In Table 9 are listed all Teacher Leadership codes and the most typical associations on the category sets: Pupil Activity, Action Sequencing, and Grouping Arrangements.

From Table 9 one can see that several action structures account for most of the occupancy time. In the first, Not in Segment, the teacher is not responsible for cuing tasks and performances; students work with their own materials in a self-paced, private manner; 21 per cent of the occupancy time is so employed. The Watcher-Helper pattern is quite similar except that the teacher is now present in the segment and the entire class is involved. The occupancy time was 7,901 minutes or 8 per cent of the total. The portions of Table 9 marked 3a, 3b, and 3c are recitational in the common-sense use of that word. Sometimes the teacher kept discussion and question-and-answer at a minimum and functioned to signal performances; she was an Action Director. At other times question-and-answer and discussion were more prominent; the teacher took the role of Recitation Leader. Since the distinction between Action Director and Recitation Leader was a matter of degree and since, for Table 9, data simplification was the goal, the two Teacher Leadership patterns have been combined. The difference between entire class and group organization and between recitation with and without accompanying individual tasks have been maintained. It can be seen that the recitation-like pattern was quite important; portion 3a involved 55 segments and 19,135 minutes of occupancy time. The 3b structure, well represented by the reading circle form, occurs with great frequency, 90 times; it represents 10 per cent of the occupancy time.

The combination of recitation with individual tasks, 3c, was relatively infrequent, 7 segments and 3,961 minutes of occupancy time. It is also significant that cases in which the pattern required the teacher to impart and the students simply to take in were not highly salient. In Table 9, the Instructor and Reader forms obtained 17 segments and 3,845 minutes of occupancy time. Finally, the action structure of teacher directing Readying (i.e., usually getting ready to leave) was reasonably prominent, 54 segments and 8,032 minutes of occupancy time.

When the data are clustered as they are in Table 9, it can be seen that relatively few action structures account for most of the segment patterns; the Table 9 groupings make up 67 per cent of the segments and 73 per cent of the occupancy time.

The significance of some of the patterns in Table 9 is more apparent if one considers the associations which did not appear. Associations of minimal or overseer Teacher Leadership with externally oriented and paced, interdependent codings are absent from Table 9 because such combinations were quite rare. To illustrate, we may consider how the 41 Academic segments which had either Not in Segment or Watcher-Helper leadership codes were coded in the other category sets: on Pupil Activity, only 5 per cent showed external orientation; on Action Sequencing, only 5 per cent revealed external pacing; and on Grouping, only 10 per cent allowed for pupil interdependency.

Table 9. Action Structures Commonly Employed in Classroom Segments

Teacher Leadership	Pupil Activity	Action Sequencing	Grouping Arrangements	Number Segments	Total Occupancy Minutes
1 Not in Segment	Own Matrl Task	Self Pace	Group Private	14	20,588
2 Watcher-Helper	Own Matrl Task	Self Pace	Class Private	13	7,901
3a Action Director Recit Leader	Class Events Attend	Ext Pace Serial Perform	Class Interdependent	55	19,135
3b Action Director Recit Leader	Class Events Attend	Ext Pace Serial Perform	Group Interdependent	90	9,778
3c Action Director Recit Leader	Class Events Task	Ext Pace Serial Perform	Class Interdependent	7	3,961
4 Instructor Reader	Class Events Attend	Ext Pace No Perform	Class Interdependent	17	3,845
5 Action Director	Readying	Ext Pace No Perform	Class Neither Interdependent Nor Private	54	8,032
			Sum	250	73,240
			Per Cent of All Data	67	73

It might be assumed that if the teacher does not direct the segment, pupils must necessarily orient only to their own materials, pace themselves, and avoid interdependent relations; this is not the case. In nonteacher directed segments students can function in such roles as committee members, players of academic games, pupil-teachers, and so forth. When students have such functions, the segments involve attention beyond one's own materials, external pacings and interdependent relations. Such structures were, however, significantly infrequent in the present third-grade data.

The associations of active teacher functions of Action Director and Recitation Leader to Pupil Activity categories also yield some illumination regarding the classroom environments. The major Pupil Activity code employed was Class Events/Attend; this meant that pupils spent time orienting to classroom activity but that they had no task of their own. Another format provision gives pupils tasks of their own as a part of the larger interdependent class activity. Such an action structure appears in Table 9 as 3b. Here attention to class events is coupled with individual tasks; however, occupancy time is notably less for this arrangement than it is for the 3a pattern which has no task.

The remaining patterns in Table 9 will not be discussed; they are shown in order to complete the display of associations to all Teacher Leadership patterns.

The general import of the action structure data seems to be that pupils work on clear tasks when the teacher is relatively inactive, they listen (and occasionally recite) when she is active. There seems to be an ecological simplicity about the structures which may reflect the assumption that these pupils work better if they are not externally and socially oriented; they attend better if they are not simultaneously involved in tasks.

Teacher Acts in the Classroom Environment

The position of the teacher in relation to segments in the classroom is two-sided; she creates and maintains the segment, yet, she is also an inhabitant of the segment and subject to its demands. In the following section, teacher acts will be examined in terms of their frequency and type; the relationships between segments and teacher acts will be explored.

Amount and Kind of Teacher Acts

Number of Teacher Acts

The number of teacher acts for each teacher on each day of observation is shown in Table 10. The distinction between acts directed to individuals and to groups has been preserved.

Perhaps the most impressive fact shown in Table 10 is the sheer quantity of activity in a teacher's day. No teacher employed less than 1,000 acts; Mrs. Apple engaged in over 1,600. Over all, teachers

Table 10. Number of Recorded Acts Directed to Individuals and to Groups by Six Teachers on Two Full Observation Days

	Mrs. Apple	Mrs. Berry	Mrs. Carr	Mrs. Dodd	Mrs. Eddy	Mrs. Ford	Means
Day 1							
Individual	800	659	726	861	839	563	741
Group	594	401	647	375	646	508	529
Total	1394	1060	1373	1236	1485	1071	1270
Day 2							
Individual	990	652	670	706	939	666	771
Group	663	498	539	400	592	528	537
Total	1653	1150	1209	1106	1531	1194	1307
Days 1 and 2 (Mean)							
Individual	895	656	698	784	889	615	756
Group	629	449	593	387	619	518	533
Total	1524	1105	1291	1171	1508	1133	1289

responded at a rate of four acts per minute. It should be emphasized that these figures surely understate the amount of teacher activity invested in creating and managing a classroom day. Observers undoubtedly missed some acts; furthermore, activities not directed to students, such as preparing or putting away materials or bookkeeping and grading, were not included in the count. For the six teachers observed, behavioral output was high indeed.

Inspection of Table 10 indicates possible consistency among teachers with regard to output. For example, Mrs. Apple emitted the most acts on both days; Mrs. Berry, the least. The Spearman rho between Day 1 and Day 2 for the output of these six teachers is .77 (.83 is required for $p < .05$). A larger sample might show statistically demonstrable consistency in output. From Table 10 it is also clear that acts directed to individuals are more frequent than acts to groups; this result holds for each teacher on each day, for all twelve comparisons.

So far, it has been established that teacher output was high and that well over half of that output went to deal with individual students. What is not known is the nature of the output. What are teachers doing with these many acts?

Kind of Teacher Acts

Kind of teacher activity is displayed in Table 11. Here, for simplicity's sake, the individual vs. group difference is ignored and the two days are combined. More complete description of the codes involved may be found on page 27.

The question can be asked: To what are teachers' acts directed? An easy answer is: They must be directed to teaching students. However, this easy answer gains only meager support from the data in Table 11. The acts that are most directly teaching are clustered under the heading Teaching. These acts are Recitation Questions, Feedback, Imparting Knowledge and Work Status Questions. Note that these Teaching clusters account for only one-half of the teachers' acts. (An unknown proportion of the Individual Problems must also be direct teaching acts but these are not frequent enough to add substantially to the Teaching percentages.) There is an impressive between-day consistency in the proportion of acts in this cluster, 51.2 per cent on the first day and 50.1 per cent on the second. Also, teachers differed substantially and consistently regarding the proportion of acts which involved the Teaching categories: on both days, Mrs. Carr showed well over 60 per cent; Mrs. Berry, under 40 per cent. The Spearman correlation between Day 1 and Day 2 for teachers' per cent of Teaching acts is very high ($rho = .943$, $p > .01$).

Further consideration of Table 11 suggests some of the causes of the high rate of teacher activity. Foremost is the large number of Recitation Questions; 35 per cent of all acts fall here. Recitation formats, by their nature, require high teacher activity; the segment analysis of the classroom reveals that recitation formats account for about 43 per cent of the segments (see items 3a, 3b, and 3c in Table 9). The high number of Recitation Questions, then, is hardly surprising.

Perhaps less expected is the large number of acts which are devoted

Table 11. Per Cent of Each Teacher's Acts Devoted to Various Functions. Days 1 & 2 Averaged

	Mrs. Apple	Mrs. Berry	Mrs. Carr	Mrs. Dodd	Mrs. Eddy	Mrs. Ford	Mean Per Cent
TEACHING	44	38	65	50	59	48	51
Recitation Questions	30	25	51	36	42	28	35
Feedback	6	5	7	7	8	10	7
Knowledge	5	6	6	5	7	10	7
Work Status Questions	3	2	1	2	2	1	2
STRUCTURING BEHAVIOR	25	31	19	22	20	21	23
Movement of Props, Pupils	11	10	9	9	10	9	10
Structure	8	9	5	8	6	8	7
Attention Changes	4	6	3	3	2	3	3
Information Seeking	2	6	2	2	2	1	3
DEALING WITH DEVIATING BEHAVIOR	15	19	8	16	9	19	14
Stance, Energy Improvement	7	11	5	5	3	10	7
Countering	7	7	3	9	5	8	6
Permission	1	1	0	2	1	1	1
OTHER ACTS	16	12	8	12	12	12	12
Individual Problems	11	6	6	8	10	8	8
Amenities and Miscellaneous	5	6	2	4	2	4	4

to Structuring Behavior, a cluster of teacher efforts sharing the common quality of marshalling props and pupils for classroom operations. The marshalling process generates and maintains activity structures which are supposed to enable or protect teaching and learning. A glance at subcategories in Structuring Behavior shows that almost 10 per cent of teacher acts attempt movement of pupils or props. Other preparing and supportive acts are frequent. Orienting and assigning pupils to Academic or Other Tasks, this Structure subcategory requires 7 per cent of the teacher acts. Information Seeking about "who is to do what," accounts for 3 per cent; and asking for Attention Changes, 3 per cent. These Structuring Behavior moves which are designed to enable more direct teaching but are not themselves Teaching accounted for 23 per cent of all teacher acts.

The section marked Dealing with Deviating Behavior also indicates frequent usage. The word deviating is used here in a very general sense; teachers often attempt to improve behavior, counter behavior, or legitimize behavior (as in giving permission); the teacher deals with behavior that is, or could become, divergent from her regime. Deviancy control, in the sense of blocking and punishing wrongdoers, is only a part of this larger cluster of acts called Dealing with Deviating Behavior. The larger cluster takes up 14 per cent of teacher acts.

The stronger control measures are identified by the subcategory of Countering. Here the teacher, at the least, blocks or forestalls a pupil's behavior; at the most, she rejects and criticizes it. The Countering per cents for teachers on Day 1 and Day 2 are highly correlated ($rho = .83$, $p < .05$). Apparently Mrs. Carr and Mrs. Eddy were better able to gain control without stiff measures than were Mrs. Dodd, Mrs. Ford, and Mrs. Apple.

Finally the Individual Problems category contains 8 per cent of the acts. As mentioned before, the content of these acts was not heard by the observers; the context often suggested some special assistance to the student. To have this much of the teacher behavior so minimally described is unfortunate. However, the presence of this 8 per cent adds to the impression of much individual pupil attention in teacher activity.

The material on kind of teacher activity can be summarized by answering again the question "What does the teacher do with her many acts?" Following is a listing of the 10 most prominent categories together with the per cent of all teacher acts given to each category.

The Individual target vs. Group target distinction has been maintained:

Recitation Question	Individual	24%
Recitation Question	Group	12%
Individual Problems	Individual	8%
Countering	Individual	7%
Feedback	Individual	6%
Structure	Group	6%
Attention Shift	Group	6%
Impart Knowledge	Group	5%
Movement	Group	5%
Movement	Individual	4%

Segment Type and Teacher Acts

The preceding account described teacher effort in terms of the function, the direction, of individual acts. But teachers are doing more than emitting acts in a relatively rapid sequence; they are creating, maintaining, and dissolving patterns of activity or segments. These many acts occur within a context; they are manifestly dedicated to larger considerations than one question to a reciter, one exhortation to a laggard, or one bit of help to a confused child; the acts go with, they sustain, segments.

A portion of the teacher's activity in any segment is so manifestly required by the known action structure that description of acts seems mere quantification of the obvious. For example, it will soon be demonstrated that Recitation Questions are frequent in segment types in which the teacher is a Recitation Leader. These questions are the body of that segment, they create it, they are the teacher's constituent performances for that segment. In a quite different segment involving class study and a teacher leadership pattern of Watcher-Helper, the teacher offers a number of acts coded Individual Problems; these are really constituent performances in the supervised study hall kind of activity for which the teacher is responsible.

Although some associations of kinds of acts to kinds of segments are obvious because the acts define aspects of segment, some associations are less required, less matters of definition. As the teacher contributes the required activity, conditions are created which may prompt additional yet different activity. The teacher may start a segment with usual Structure and Recitation Questions and find that the segment needs protection; illegal pupil activity must be suppressed, careless behavior improved. The latter, Dealing with Deviating Behavior, is not a part of the segment's definition, but it may be more frequently required in some segments than in others. In any particular case, the line between constituent performances vs. activity elicited but not demanded by a segment's action structure can be vague; in general, however, the activity of participants in any structure is not all implicit in the outline of that structure.

The presentation of the association of teacher acts to segment types will refer to some of the major action structures appearing in Table 9. These segment types are described beneath the abscissa in Figure 2. To simplify exposition, shortened names will be given to each segment type.

The action structures taken from Table 9 involved some kind of academic Concern. To add variety, one nonacademic segment type was employed, Music. Periods of music were available for five of the six teachers (Mrs. Ford had none); music was selected because no other nonacademic or nonprocedural activity provided such a large amount of data.

Number of Teacher Acts Related to Segment Type

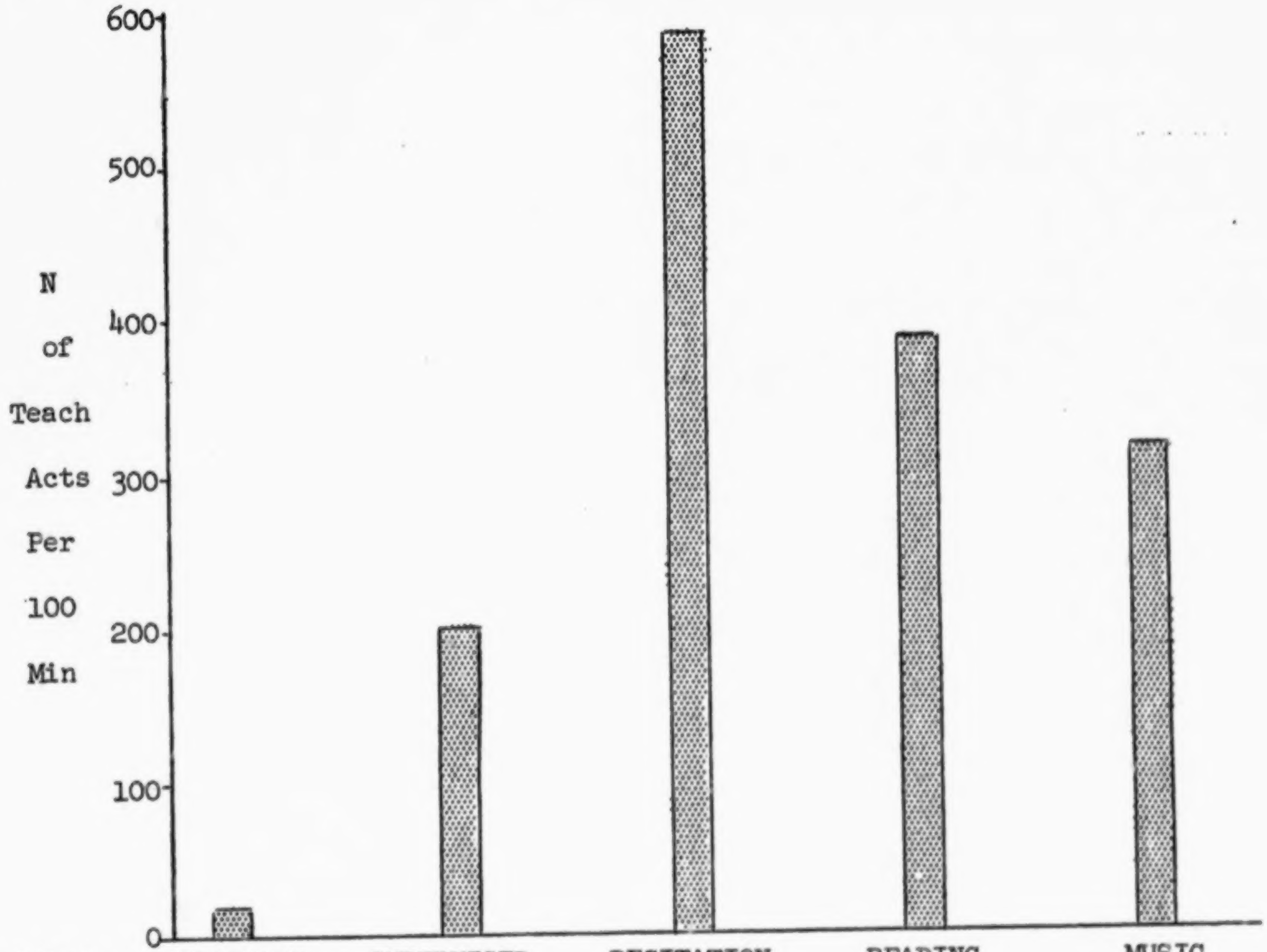
Teacher Act quantities in Figure 2 are expressed as "number per 100 minutes." Since segments are of different length, a method of equating activity was necessary. Use of percentages was avoided in this particular analysis because percentages misrepresent the data for Seatwork. Since, in this activity, the teacher is officially Not in Segment, those acts which she does direct to it are likely to be highly corrective; thus the percentage of Dealing with Deviating Behavior in Seatwork is quite high (40 per cent). The large percentage of controlling behavior is an artifact based on few total acts going into the computation. As can be seen in Figure 3 the amount of Dealing with Deviating Behavior in the Seatwork segments is quite small.

The pattern of differences in Figure 2 was tested by a Friedman Two-Way Analysis of Variance test. The rate of teacher acts for each teacher was ranked; this yielded five sets of ranks. It was found that for each teacher, Recitation segments ranked first and Seatwork ranked fifth (last); with some exceptions among teachers, Reading Circles and Music ranked second and third, and Supervised Study fourth.

The resulting significance test was $p < .01$. The association of amount of teacher activity with segment type was increased by the presence of Seatwork in the analysis; since the teacher is officially Not in Segment, a low activity rate is expected. However, when Seatwork is removed and the remaining, the teacher present, segment types are used for analysis, the Friedman test is still significant, $p < .02$.

Some of these results are to be expected on the basis of the action requirednesses of the various segment types, e.g., low teacher activity when she is, officially, Not in Segment, more when she oversees study, still higher act output when she acts as either Recitation Leader in an Academic segment or as Action-Director in Music segments.

Perhaps not so expected is the much higher output elicited in the total class Recitations as compared to the smaller Reading Circles.



Label:	SEATWORK	SUPERVISED STUDY	RECITATION	READING CIRCLE	MUSIC
Table 9 Line Number	1	2	3a	3b	--
Actual Pattern					
Teach:	Not in Segment	Watcher-Helper	Recit Leader	Recit Leader	Action Director
Pupil Act:	Own Matrl Task	Own Matrl Task	Class Events Attend	Class Events Attend	Sing, Chant, Play Instr.
Sequence:	Self Pace	Self Pace	Ext Pace Serial Perform	Ext Pace Serial Perform	Ext Pace Mass Perform
Grouping:	Group Private	Class Private	Class Interdependent	Group Interdependent	Class Interdependent
	Academic	Academic	Academic	Academic	Music

Figure 2. Rate of Teacher Acts in Segments of Indicated Types

Causes of the differences are not known; they may have to do with size of group and the extra demand this puts on the teacher. The difference is sizeable and it occurs for each teacher. (All six teachers were used in this analysis, Wilcoxon $p < .05$.)

Kind of Teacher Act Related to Segment Type

Relationships between segment type and type of teacher act are the next concern; the question is whether teacher activity differs in kind as well as in amount in the various segment types. Data are presented in Figure 3.

Differences shown in Figure 3 have been subjected to the Friedman tests. The rate of each teacher act for each segment type was ranked, giving five sets of rankings. (Mrs. Ford's class had no Music segment and was omitted from these analyses.) Thus the comparative rates for Teaching acts in the various segments were compared first. Then those for Structuring Behavior and, finally, Dealing with Deviating Behavior were compared. (Segment types on Individual Problems were not ranked; it is clear from Figure 3 that only Supervised Study had a special amount of this kind of teacher act.) All Friedman tests were significant at or beyond the .01 level. A second, more stringent analysis was used. Since the Seatwork segment type has so few acts, it tended to contribute to all tests of association; therefore, this segment type was left out of the analysis and only the remaining segments were tested. From this analysis, the rate of Teaching acts was significantly different across segments, $p < .01$; the rate of Structuring Behavior was also significant, $p < .05$; the rate Dealing with Deviating Behavior showed only a trend, $p < .15$.

Regardless of the particular analysis performed, Figure 3 demonstrates that the kind of teacher activity is strongly associated with the segment type. Some of the association seems required, high Teaching acts in Recitation and high Individual Problem acts in Supervised Study.

The high rate of Structuring Behavior acts for Music was less predictable on the basis of the action structure, however, reflection shows it to be reasonable. In Music teachers do much starting and stopping of activity, explanation of who is to do what, and when calling attention to matters of pitch and expression, and so on.

The rate of Dealing with Deviating Behavior was always higher in Music than in Reading Circles and was usually higher in Recitations than in Reading Circles. Figure 3 shows that the Recitation segments have almost double the rate of Dealing with Deviating Behavior of Reading Circle segments. Further analyses of all data for all teachers relating to Dealing with Deviating Behavior in class Recitations vs. the Reading Circles showed a relationship in the same direction, $p < .10$.

If future research should show that Dealing with Deviating Behavior is significantly greater in one segment type than others, the finding would be another example of a teacher activity outcome not implicit in the action definition of the segment structure.

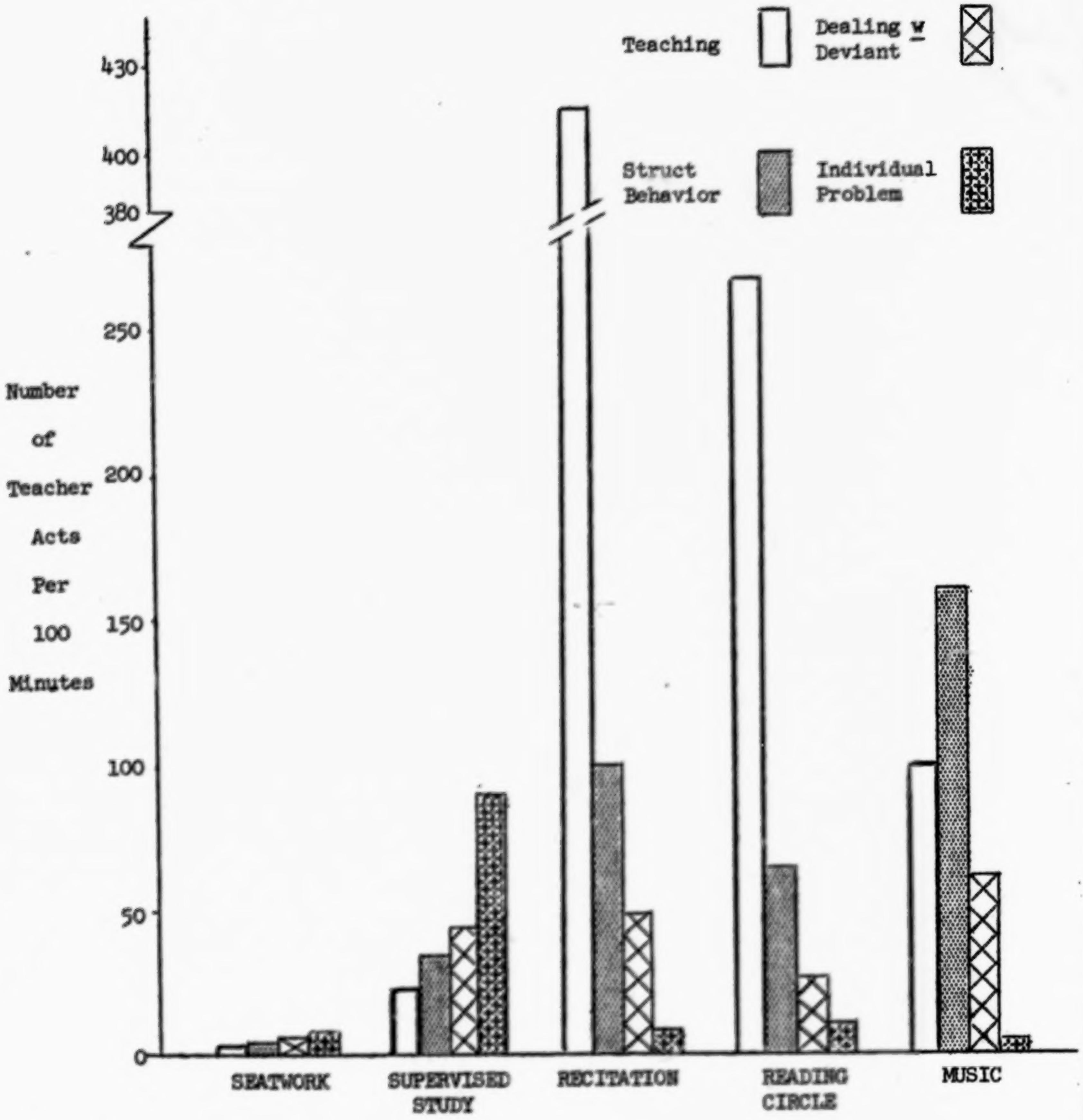


Figure 3. Rate of Kinds of Teacher Acts in Segments of Indicated Types

Transition and Teacher Acts

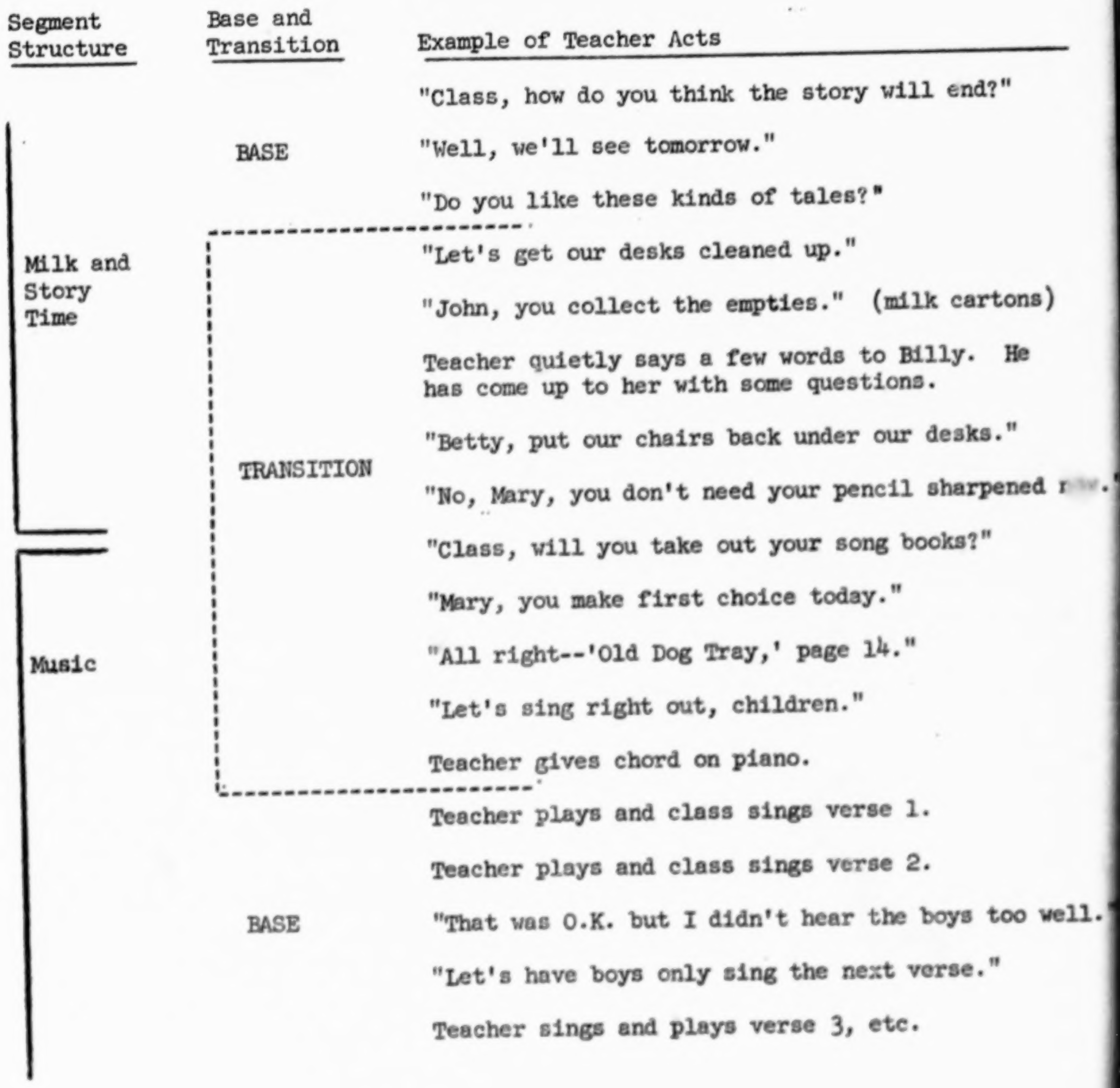
The acts or moves of a teacher come in a sequence; this sequence can be placed beside the segment structure. When this juxtaposition is made, one fact becomes quite impressive. Not only do acts come in different patterns as different segments arise, but within a single segment acts at the end points display different patterns than those in the center, or the body, of the segment. Inspection shows that some of these acts at the end of a segment are efforts to end it properly; efforts at the beginning of a segment are often directed to starting the action with order and energy. The transition phase begins with the first close-out activity in the prior segment and ends with the first round of core activity (nonpreparatory activity) of the subsequent segment. For analysis one may consider all acts in this phase together; they are all in the transition phase; most, but not all, direct the transition.

The teacher activity in a segment which does not occur in a transition phase, which is in the center or body of the segment, is in the base phase of the segment. The analysis to follow will deal then with the pattern of teacher acts emitted when the teacher is in the Base vs. the Transition phases of the segment structure. The relation between Teacher Acts, Segment Structure, and Transition and Base phases is exemplified in Figure 4. Note that although the Transition phase has a unity in that an effort to change states is clearly made, it is also appropriate to see part of the transition as belonging with one segment and part with another. Also significant in Figure 4 are the remarks to Billy and Mary; the teacher must counter the behavior of Mary, a reasonably frequent problem in transition. The content of the reaction with Billy is not known but the chances are that Billy was using this break in activity to get help from the teacher. Neither of these teacher acts, although occuring during the transition, was transition-directing. There are numbers of acts which can be found in the transition period which do not guide the transition: one last bit of academic information may be presented, one child's problem with his lost book may be handled, one messenger sent to the office, and so forth. In material to follow those teacher acts which direct the transition will be labelled Transition Directive ; those, like the moves just cited, will be termed Transition Other .

There was a type of transition sufficiently extensive and structured to be a segment in itself; this was the period of leaving for recess or home. The segment usually included putting away some props and procuring others; it always contained a coming to order and a dismissal by signal. The departure segment will be considered in the analysis under the label, Leaving Segment; it seems to be special transition deserving separate attention.

Transition and Number of Teacher Acts

The extent of teacher effort invested in the periods of getting from one segment to another and to leaving may be assessed by inspection of Table 12. Three-quarters of the teachers' acts occur during the Base; the rest during Transitions and Leavings. In per cent terms, only limited variation between teachers or days exist; Mrs. Carr kept 83 per



Segment Structure	Base and Transition	Example of Teacher Acts
		"Class, how do you think the story will end?"
Milk and Story Time	BASE	"Well, we'll see tomorrow."
		"Do you like these kinds of tales?"
	TRANSITION	"Let's get our desks cleaned up."
		"John, you collect the empties." (milk cartons)
		Teacher quietly says a few words to Billy. He has come up to her with some questions.
		"Betty, put our chairs back under our desks."
		"No, Mary, you don't need your pencil sharpened r
Music		"Class, will you take out your song books?"
		"Mary, you make first choice today."
		"All right--'Old Dog Tray,' page 14."
		"Let's sing right out, children."
		Teacher gives chord on piano.
	BASE	Teacher plays and class sings verse 1.
		Teacher plays and class sings verse 2.
		"That was O.K. but I didn't hear the boys too well."
		"Let's have boys only sing the next verse."
		Teacher sings and plays verse 3, etc.

Figure 4. Illustration of Relationship between Base and Transition within the Segment Structure (Fictitious but Representative Case)

cent of her acts in the Base phases; Mrs. Apple, 69 per cent. The other way of stating the finding is that 17 to 31 per cent of teachers' acts go to the change periods of the day. This translates into an average of 341 acts; for particular teachers even more are possible. On one of her days, Mrs. Apple devoted 500 acts to these periods.

Several regularities appear in Table 12. The Transitions require more acts than the Leavings, but then there are usually four leaving periods in a day and thirty-one transitions. The Transition-Directive acts always outnumber the Transition-Other acts, usually by more than two to one. Data not displayed reveal that the acts marked Transition-Other are more likely to be individual than group-directed; this was true for each teacher on each day. One gets the impression that teachers pick up many odds and ends in their Transition-Other acts. For example, an average of 40 per cent of these acts are directed to Individual Problems; about 24 per cent more acts go into pressing or countering individual activities, Dealing in Deviating Behavior.

Table 12 Per Cents of All Teacher Acts Which Occurred at BASE, TRANSITION (Directing and Other), and LEAVING portions of the Segment Structure.

	Mrs. Apple		Mrs. Berry		Mrs. Carr		Mrs. Dodd		Mrs. Eddy		Mrs. Ford		Mean	
Days:	1	2	1	2	1	2	1	2	1	2	1	2	1	2
BASE	69	70	74	67	82	83	77	70	80	76	71	71	75	73
TRANS.	19	20	17	21	10	8	13	15	14	17	16	19	15	17
Dir.	13	12	13	8	8	7	9	11	10	13	14	14	11	13
Other	6	8	4	3	2	1	4	4	4	4	2	5	4	4
LEAVING	12	11	10	11	7	8	10	15	6	8	13	10	10	10

Transition and Kind of Teacher Act

The next matter of interest is the kind of teacher acts which occur at these various phases. If a quarter of the teachers' activity occurs at Transitions or Leavings, what kind of activity is it?

The four classes of Teacher activity used to describe behavior on segment types are again displayed in Figure 5. Here can be seen the changes in quality of teacher behavior as she operates in the various phases of the segment structure.

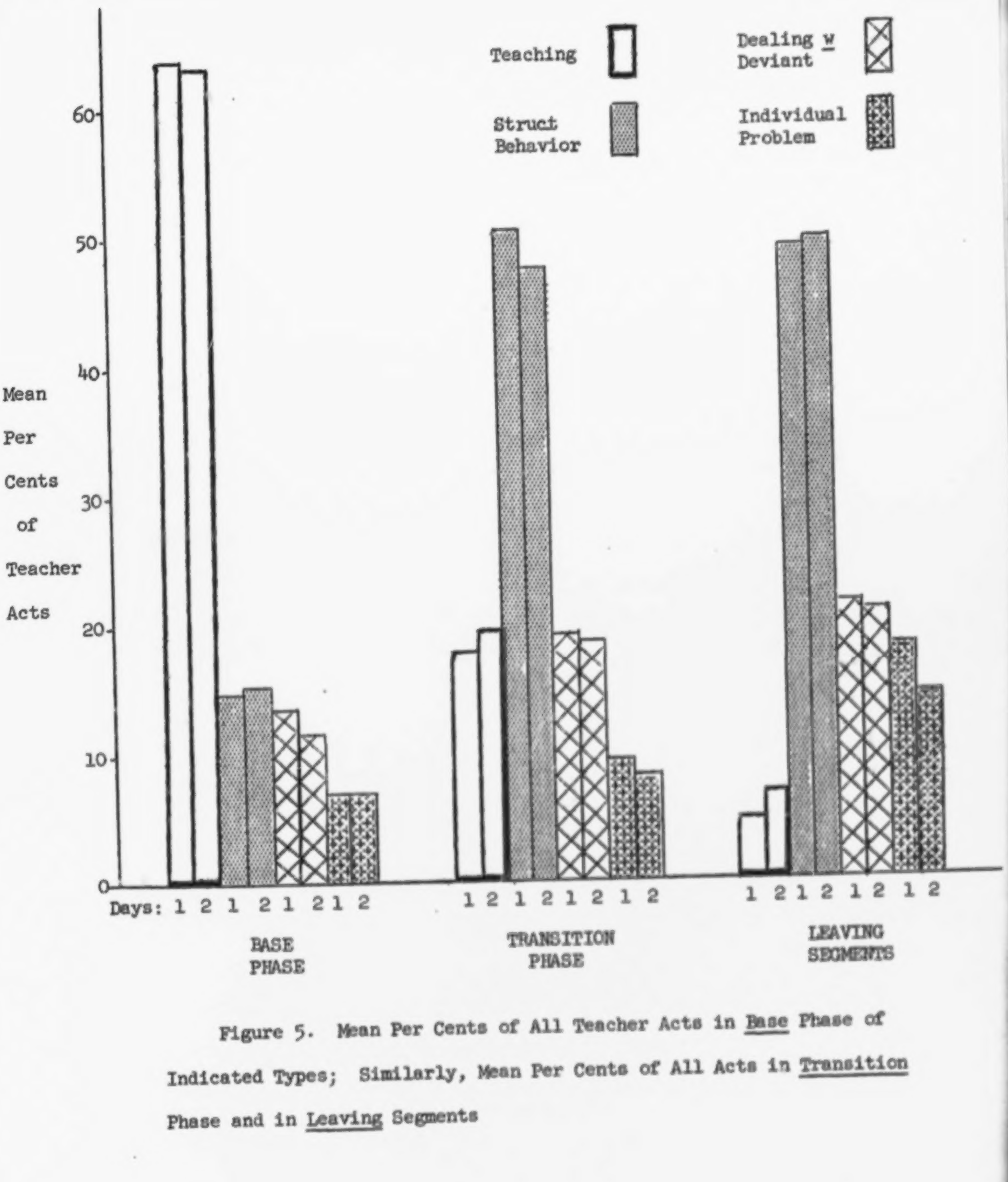


Figure 5. Mean Per Cents of All Teacher Acts in Base Phase of Indicated Types; Similarly, Mean Per Cents of All Acts in Transition Phase and in Leaving Segments

When data on segment type and teacher acts are reported, high amounts of certain acts for certain segments are a reflection of the teachers' constituent performances in those segments. The constituent performance aspect is even more obvious in the phases displayed on Figure 5. Teaching acts dominate the Base phases, and Structuring Behavior acts predominate in the Transition phase and in the Leaving segments. There is marked consistency in this pattern from Day 1 to Day 2.

A less expected finding is the association of Dealing with Deviating Behavior acts to phases. These acts are much more common during Transitions and Leavings than in Base segments. Friedman tests showed very high consistency from teacher to teacher, Day 1, $p < .01$ and Day 2, $p < .01$. Evidently movement from segment to segment and from classroom to out-of-doors requires more than the signals and information represented in the Structuring Behavior cluster; such movement brings on the need for the pressing, countering, and criticizing acts in the Dealing with Deviating Behavior cluster.

Other teacher acts highly associated with the phase of the segment structure are in the Individual Problem category. Teachers engage in these quiet face-to-face interactions somewhat more frequently in Transitions, much more frequently during Leaving segments.

The Friedman analysis yielded a significance on Day 1 of $p < .002$, on Day 2 of $p < .052$. Although Dealing with Deviating Behavior and Individual Problems are high for both the Transition phase and the Leaving segments, the most consistent (i.e., teacher-by-teacher) pattern, is the greater number of Dealing with Deviating Behavior in the Transition phase and the increase of Individual Problems from Base to Leaving. Figures 6 and 7 illustrate these changes in teacher act percentages.

Transition Phases Compared to Leaving Segments

Since Transition phases and Leaving segments were analyzed separately, it can be asked if these periods of the day yield different patterns of teacher acts. Teaching acts, as shown in Figure 5, are 3 times as frequent in Transitions as in Leaving. The result is not unexpected. In Transitions the teacher often operated from one segment which required pedagogical activity toward another of the same type. In Leaving the next segment in the sequence was never a pedagogical one.

Another apparent difference between Transition and Leaving related to Individual Problems. For Transition the average of acts coded Individual Problems was 9 per cent; for Leaving segments it was 16 per cent. The difference was not quite statistically significant, however ($p < .15$). Other distinctions between teacher act patterns at Transition phases vs. Leaving segments are not visible on Figure 5. However, review of the data showed that categories within the Structuring Behavior cluster contained different per cents of teacher acts. Categories of Structure (explain, assign activities) and Attention Shift (direction of attention to different target materials or different points within materials) were heavily concentrated in the Transition phases;

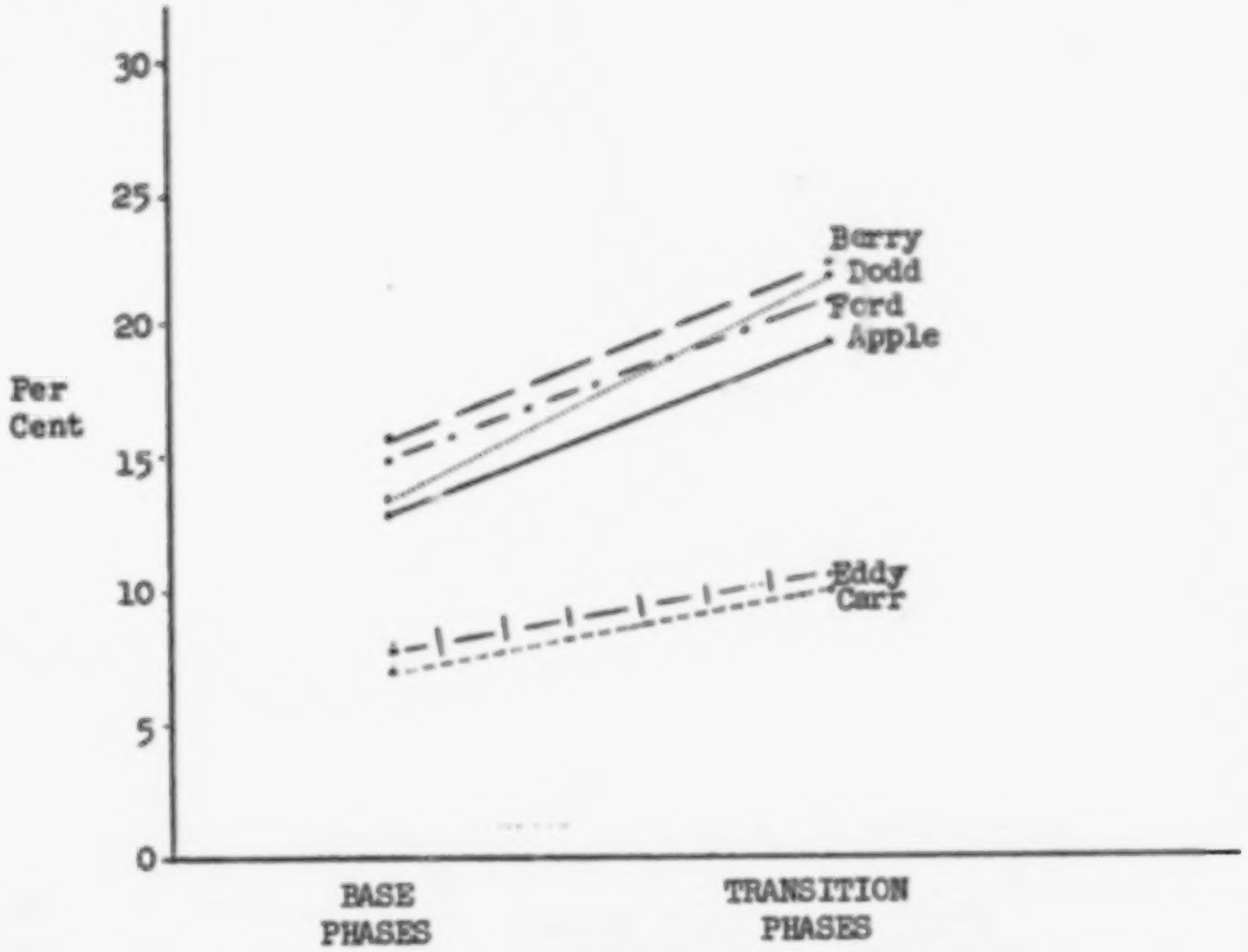


Figure 6. Per Cents of Each Teacher's Acts Devoted to Dealing with Deviating Behavior Occurring in Two Phases of the Segment Structure

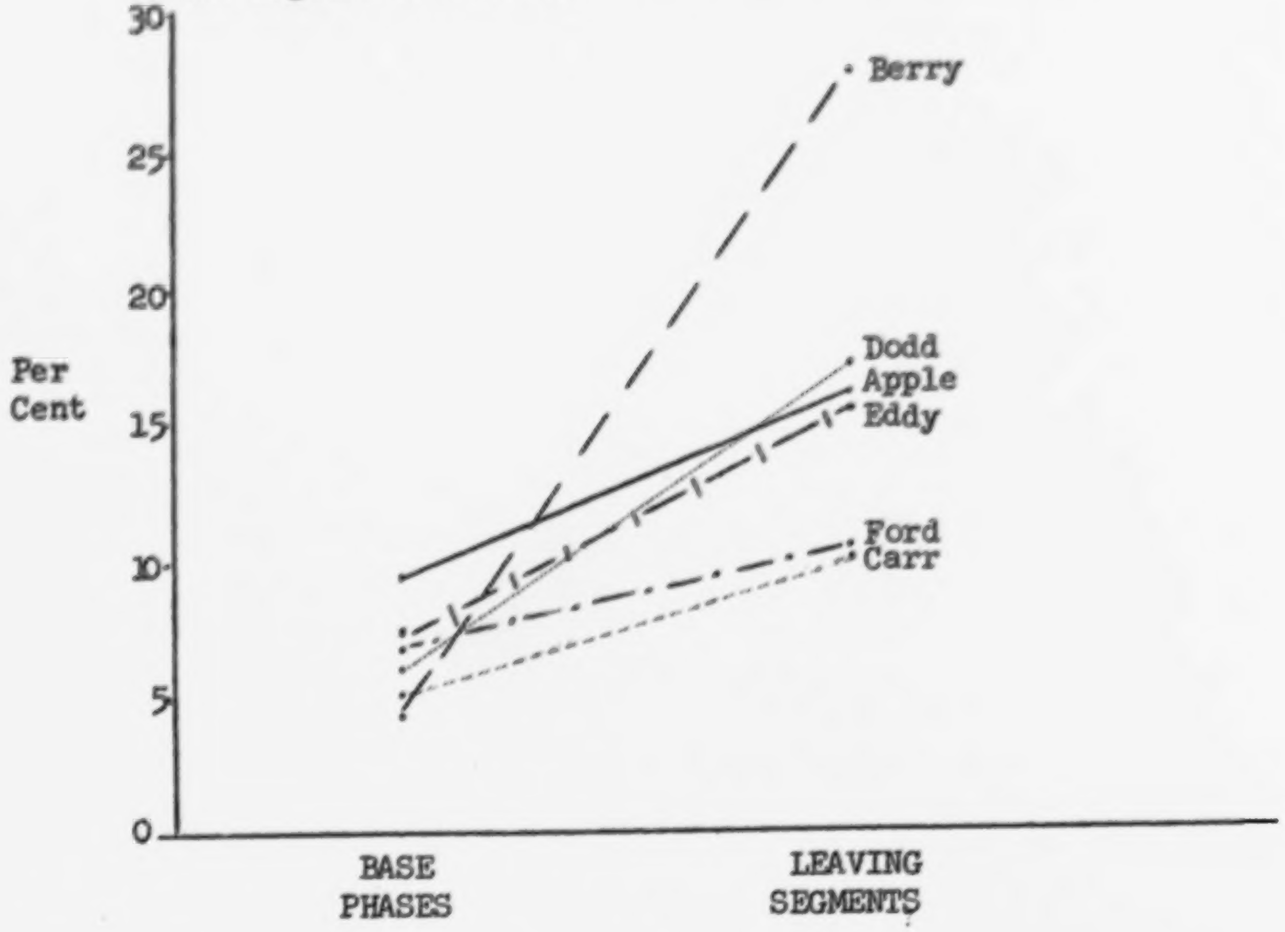


Figure 7. Per Cents of Each Teacher's Acts Devoted to Individual Problems in Two Phases of the Segment Structure

Movement (change of place or position of pupils and props) was important at Leaving. These differences yielded p values of .01 or greater.

Pupil Behaviors in the Classroom Environment

Pupil behavior was coded on the basis of photographs taken at 20 second intervals throughout the day. The information extractable from these "slices" of behavior is considerably less differentiated than that available for teachers. It was possible to make estimates of degree of involvement in the ongoing activity; these estimates, coordinated to aspects of segment structure, form the dominant line of results to be reported. The photographs also made possible judgments of whether pupils were engaged in self-touching or resting behaviors. Results regarding the latter two indices will be reported later as a matter of possible interest, not because they provided clear evidence for important hypotheses.

Segment Type and Pupil Acts

One method of exploring the data is to treat each segment as a unit and compare pupil behaviors on segments with differing ratings on a category set. The punching of pupil behavior indices on segment cards facilitated this approach. The following associations show what can be obtained in this manner; for reasons to be stated later, these relationships are not offered as formal results, but as illustrations of one method of data review.

Regarding Teacher Leadership Pattern

When the teacher is centrally engaged in the segment action structure (Action Director, Recitation Leader, Instructor, and Tester), involvement scores per segment are higher than when her role is more peripheral (Not in Segment, Watch and Help): $X^2 = 8.57$, $p < .01$.

Regarding Grouping Arrangements

When groups are interdependent the smaller group (Group Together) will produce higher involvement segments than the larger ones (Class Together): $X^2 = 17.67$, $p < .001$.

Regarding Pupil Activity

It was predicted that involvement would be lowest when children attended their own materials (Own Materials/Task), median when they attended a wider field but had no continuous task (Class Events/No Task), and highest when continuous doing was involved (Class Events/Task; Draw/Make; Sing, Chant, Play Instrument: and Large Muscle Activity). Resulting analysis showed that the predicted low group (Own Materials/Task) was significantly lower than the other groups: $X^2 = 10.97$, $p < .01$. The no continuous task and the continuous doing segments were not different.

Regarding Action Sequencing

Externally-paced segments (External Pace/No Performance, External Pace/ Serial Performance, External Pace/Mass Performance) show more involvement than the segments coded Self Paced: $X^2 = 11.47$, $p < .001$. Within the externally-paced segments, those which provide for a performance (External Pace/Serial Performances, External Pace/Mass Performances) yield more involvement than those which provide no performance (External Pace/No Performance): $X^2 = 6.42$, $p < .02$.

The above approach is useful for producing leads but there is a redundancy involved. For example, when segments with central teacher leadership and externally-paced segments both produce good pupil involvement, only one finding is represented; the same segments contribute to both since central teacher action and external pacing are highly correlated. What is needed to distinguish the two are externally-paced segments with and without central teacher leadership; in the situations studied external pacing seldom occurred without teacher action.

A second method of data exploration was a graphic one. The per cent of pupil involvement and other pupil behavior indices were plotted against segment sequences. Continuous graphs for each classroom were devised. Review of these displays provided hypotheses for statistical test. A brief section of the graph of Mrs. Eddy's morning class activities is here shown in Figure 8.

The regime represented by Figure 8 is one which began at 9:50 when the total class received materials and starting help for Morning Seatwork. At 9:54 the teacher took one small group to the reading circle area. (The group's name was the name of its reader, American Adventures.) At this point the class was organized into a pair of parallel major segments. The American Adventures pupils and Mrs. Eddy participated in recitation until 10:10 when the behavior within the American Adventures segment changed; the teacher began calling on students to read aloud. This activity was judged to be different enough to be recognized as a contained segment within the major segment, American Adventures. Involvement scores on Figure 8 are based on measures taken every 20 seconds; these have been averaged to yield the minute-by-minute points. By following the involvement line (solid), a drop becomes apparent where the teacher separated herself and the American Adventures pupils from the total class. The pupils in the latter group also had lowered involvement scores (dotted line); however, they seemed to improve their involvement before the seatwork children did. (This is a suggestion which other data could confirm or deny.) More clearly represented is the persistent elevation, once things get underway, of the reading circle involvement line over the seatwork line.

The self-touching and resting scores are also coordinated to the segment structure in Figure 8. The rise and fall of these lines over time and within segments do not present a convincing pattern. (Resting may be less frequent for seatwork pupils at the beginning of their work and become more prominent later on.) What is fairly convincing about the self-touching and resting lines are the differences between segments; seatwork lines are higher than reading circle lines for both touching and resting. In the Figure 8 span, noninvolvement, self-touching and resting behaviors are related. More extensive and exact analysis would be required to determine the generality of these and other patterns apparent in Figure 8.

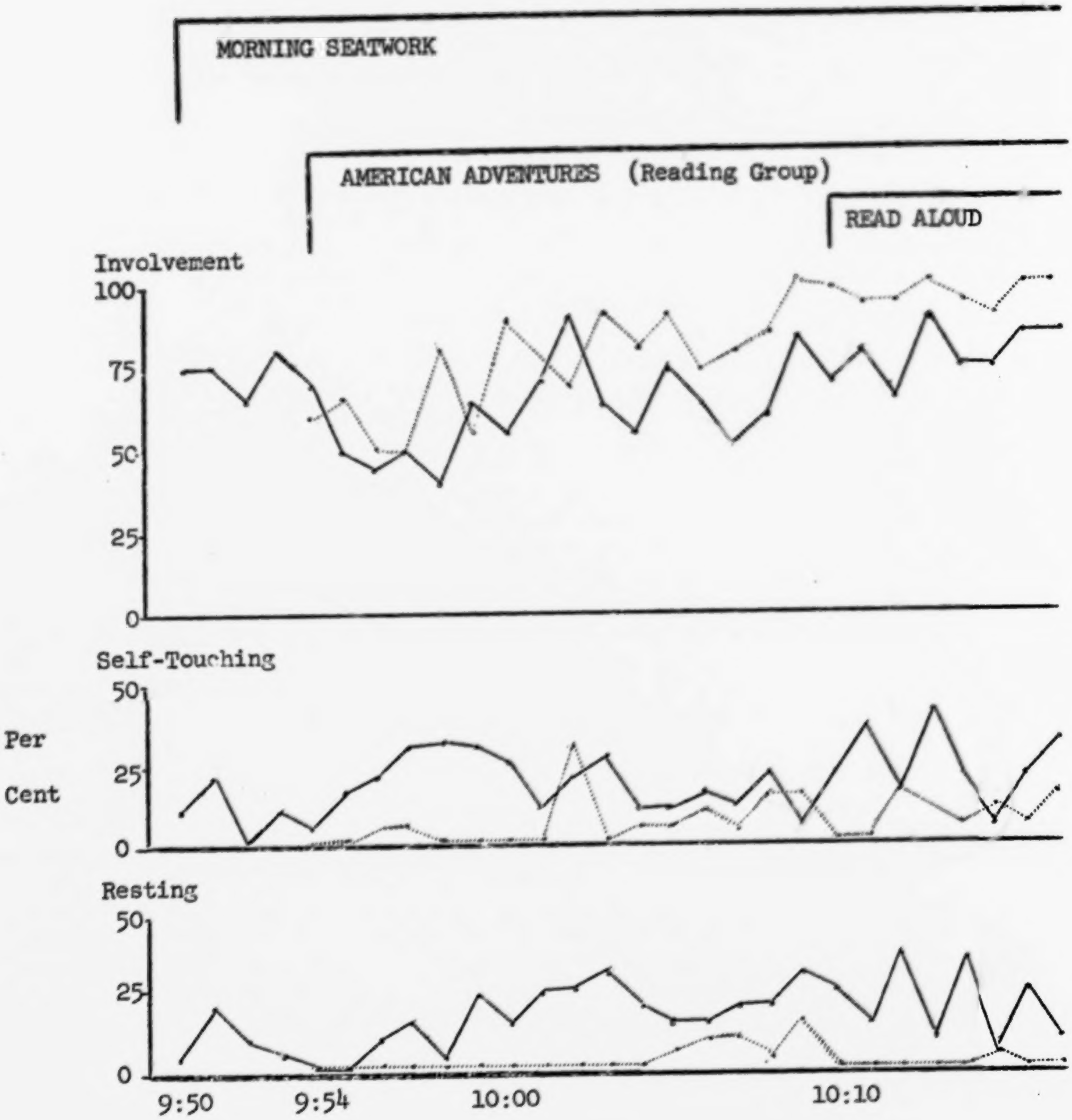


Figure 8. Per Cents of Photographed Pupils who Were Involved in Working, Were Engaged in Self-Touching, Were Resting during Segment Sequence

Key: Solid Line - Total Class or Seatwork Pupils
Dotted Line - Reading Group Pupils

Preliminary exploration using frequency counts, review of the graphic material, and some consideration of the relation of involvement to action structures yielded a number of post hoc hypotheses.

Segment types from Table 8 (with Figure 2 labels) provided clusters for certain comparisons; these types were Seatwork, Supervised Study, Recitation, Reading Circle, and the Instructor portion of the Instructor/Reader cluster. It was possible to add a Testing (orally administered) segment and one new structure called Pupil Presentation. The latter seemed worth checking because of the frequent dip of involvement lines in recitation segments containing much pupil report giving. It was as if pupils did not care to listen very long to other pupils. The hypotheses and statistical tests to be described constitute formal and clear tests of segment impact. The hypotheses tested were as follows:

1. External Pacing yields greater involvement than Self Pacing. Since external pacers were usually teachers, we may expect all segment types in which the teacher took an active central role to show more pupil involvement than those in which she took a peripheral role.

Reading Circle Recitation Instructing	>	Supervised Study Seatwork

2. Among those segments which put the teacher in an active, central role, those which, at the same time, offer some opportunity for pupil performance, or a turn, yield greater involvement than those which do not offer these performances.

Recitation, Testing > Instructing

3. Among those segments which put the teacher in an active central role and provided pupil performance, the small interdependent groups will yield greater involvement than total class interdependent groups.

Reading Circle > Testing, Recitation

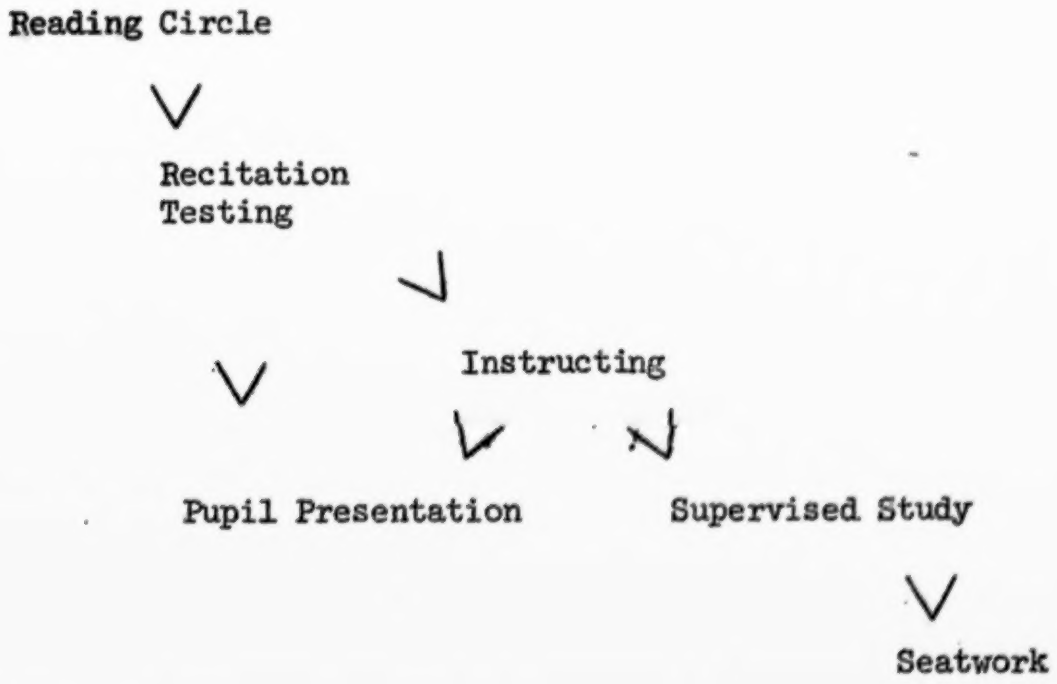
4. Among those segments which put the teacher in a peripheral role, those in which she is present yield greater involvement than those in which she is absent (i.e., involved in another part of the room).

Supervised Study > Seatwork

5. Those segments which provide teacher presentation and/or pupil short answer response yield greater involvement than segments which contain extensive pupil presentation.

Recitation Testing Instructing	Pupil Presentation

The five hypotheses, when considered together, provide a hierarchy of involvement rates which can be expressed as follows:



Effective tests of the above relationships required that stabilized individual differences for involvement be controlled. Ideally, each pupil's involvement score in each condition would provide data for an analysis of variance. However, a large group of pupils who participated in each and every segment type was not available; if only those students for which data were complete were utilized the N would be very small. In order not to lose data, t tests for related means were employed for all possible comparisons; thus pupils served as their own controls in each comparison, but not all students appeared in each comparison.

The results of these analyses appear in Figure 9.

With certain exceptions the hypotheses as described above were confirmed:

1. All segments involving active and central teacher function yielded higher involvement percentages than those in which the teacher was peripheral.

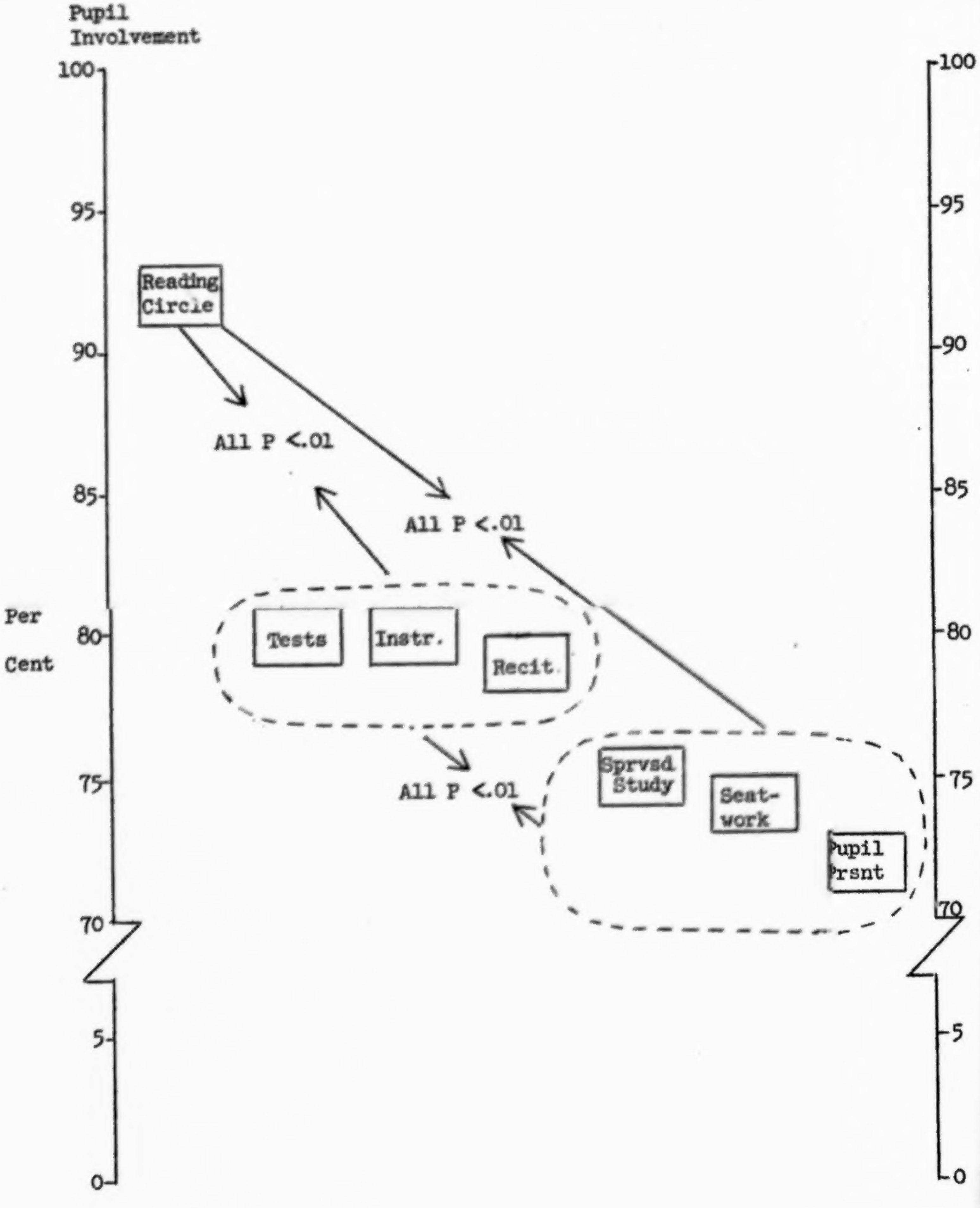


Figure 9. Per Cent of Pupil Involvement during Segments of Indicated Type

Reading
Tests
Instructing > Supervised Study
Recitation Seatwork

2. Segments with central teacher function and a pupil performance did not yield higher involvement percentages than those without such opportunity. (Data on Pupil Activity described on pages 43-44, also proved this expectation.)

Tests
Recitation not > Instruction

3. Small interdependent group segments (with teacher in the central role) yield better involvement than similar Total Class groups.

Read Circle > Recitation

4. Teacher peripheral but present segments did not yield better involvement than teacher absent segments.

Supervised Study not > Seatwork

5. Teacher presentation or pupil short answer segments yielded better involvement than Pupil presentation segments.

Reading Circle
Instructing
Test > Pupil Presentation
Recitation

A final result for involvement rates, not shown in Figure 9, relates to transitions and the periods which immediately follow them. It might be supposed that when pupils enter transitions, release from the guidance of the previous structure would lead to more divergent behavior, to less involvement. Since teachers engage in more Deviation Countering activities during transitions, more noninvolvement among pupils might be expected. However, involvement during a transition is hard to judge by reference to static photographs; too many legitimate behaviors are possible in a transition. There was not a dependable relationship between transitions and rated degree of involvement. However, the possibility remained that changes of activity have negative effects on involvement.

After some review of the graphs and some reflection, the following formulation was developed:

Beginning or resumption of activities of the academic classroom type are likely to show some depression of involvement. Beginning or resumption of self-paced activities are especially likely to show low involvement. In externally-paced segments, starts may produce a depression of involvement but these will be much less severe than starts for self-paced segments.

Examples of the above formulations may be helpful. The period of Morning Seatwork which follows recess should display particularly low involvement rates since the children usually must resume without external pacing; this period should display low involvement in comparison to later periods in the same segment and in comparison to initial or resumed periods in segments which offer outside pacing (as in Recitation, Instruction, etc.). On the other hand, beginnings of Recitation should not show such extreme depression, relative to the remainder of the same segments. The analysis determined average involvement scores for the first twelve frames of a segment and involvement scores on the remainder of those segments. Then the following comparisons were made:

> Involvement scores in beginning or resumption of self-paced segments vs. scores in the remainder of the segment. Involvement scores in the beginning of self-paced segments vs. scores in the beginning or resumption of externally-paced segments.

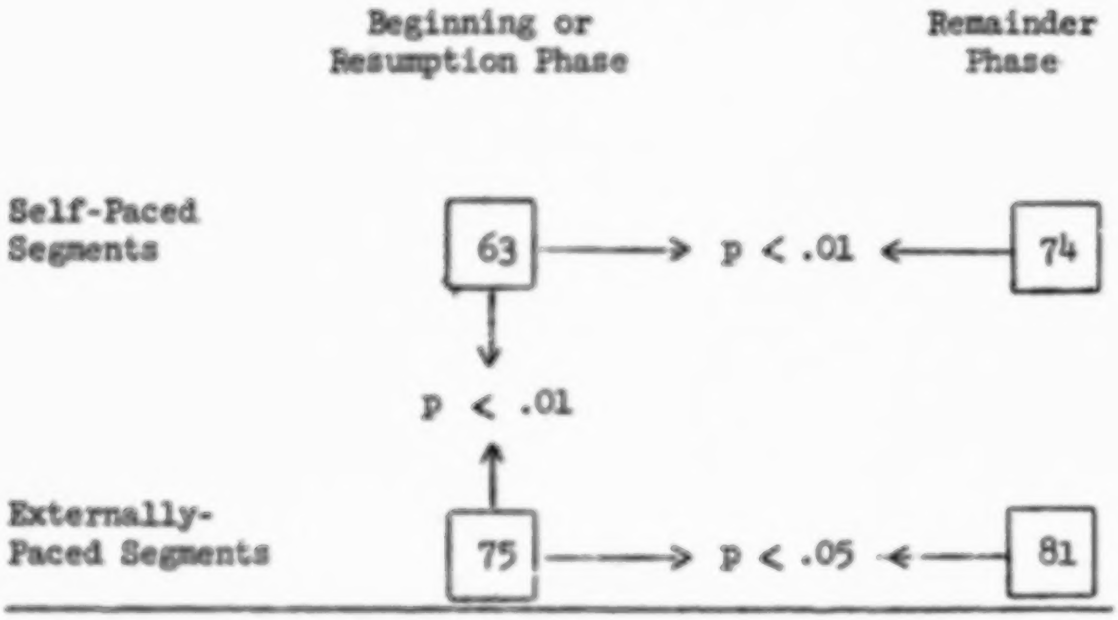
For comparability, segments with Academic Concern were used throughout; externally-paced segments were of the total-class recitation type.

Results of these comparisons appear in Table 12.

From Table 12 the special difficulties in the start or resumption of self-paced activities are clear; these starts yield significantly less involvement than occurred later in the same segment; they also show much less involvement than starting phases of externally-paced segments. Also clear from Table 12 is the fact that beginning and resumption in either self-paced or externally-paced segments show depressed involvement scores.

The association of amount of pupil involvement to segment type and to phases within segment structure appears well demonstrated by the preceding data. The popular idea that pupil involvement is a function of the pupil is somewhat in contrast to this finding. The data available from the present study indicates that pupil involvement is a function of the pupil if the same pupils are measured in highly similar ecological

Table 12 Mean Per Cent of Pupil Involvement Scores at Four Phases of Segment Structure



structures. For example, the correlation of pupil involvement in Mrs. Eddy's class for Day 1 vs. Day 2 was rho = .62, $p < .05$. A check of the segment offerings in these two days will show that they have almost identical outlines. However, when different segment types within the same classroom are compared, the correlations drop or become erratic. A sample check was made of correlations of pupil involvement scores in Seatwork vs. Reading Circle; these were low, either positive or negative.

For pupils in general, amounts of involvement in one segment would not be a reliable predictor of involvement in a segment of a different type. It is true that amount of involvement for one day helps the prediction of involvement in a second day, if both days have similar ecological structures.

Segment Structure and Resting and Self-Touching Behavior

The investigator's experience in classroom research had led to a hypothesis that Resting behavior and Self-Touching behavior were correlated. Common experience seems to support the possibility; a tired child often rubs and scratches himself. Therefore, the relationship between the two behaviors was tested and the result showed that Resting behavior and Touching behavior are positively, but modestly correlated. Spearman $r = .68$, $p < .05$. As expected, resting behavior was especially high during the Milk and Story segments, 12 per cent. Somewhat surprisingly, resting was almost as high during Pupil Presentations, 10 per cent. The low point in resting was Reading Circle, 3 per cent. There was a trend for resting behavior to go with segments with low involvement, but this was not statistically significant.

Self-Touching behavior was more variable than was resting. Self-Touching was reliably related to segment type (Friedman r, $p < .01$). The direction of this relationship can be indicated by ranking segment types from highest to lowest percentages of Self-Touching. The rank of segment types according to mean per cent of Self-Touching scores is as follows:

Teacher Read at Milk and Story Time	32%
Recitation	24%
Instruction	23%
Pupil Presentation	22%
Seatwork	14%
Supervised Study	13%
Testing	11%
Reading Circle	7%

The distribution shown seems to break at two places, after Teacher Read and after Pupil Presentations. The high Self-Touching at the rest period (Teacher Read) seems understandable; self-caressing, self-comforting behavior for primary age children might be expected during this time. A very simple explanation can be proposed for the fact that the cluster of Recitation, Instruction, and Pupil Presentation segments is higher than the Supervised Study, Testing, and Reading Circle cluster. One begins with the assumption that touching is a need of the nine-year-old child; if he has no objects for touching, he touches himself. The last four segment types have objects for touching: books, pencils, papers; the other segment types have no objects and Self-Touching is much higher. Self-Touching in Milk and Story is not inconsistent with this idea; although milk cartons are present, actual milk drinking time was usually only a fraction of the total time spent in Milk and Story segments.

Self-Touching was not significantly related to involvement.

DISCUSSION

The research sought concepts and methods by which the classroom behavior setting could be described. Recording techniques were developed and basic research documents, chronicles, were assembled. The full day's classroom activity described in the chronicles was unitized into segments; the ecological nature of the classroom was described in terms of the structure and the quality of the segments.

With description of the classroom day expressed in segments, it became possible to relate teacher and pupil behavior to the segment organization. The primary purpose of analyzing the segment and behavior relationships was to determine whether the described aspects of segments made any difference to behavioral variables of interest.

It is appropriate to draw together the major insights and findings generated by the research effort. Now that the procedures just described have been carried out, what has been learned?

Chronicles as Primary Setting Records

Since the chronicles furnished the basic data for segmentation and for teacher acts, the adequacy of these documents can be considered first. In retrospect, the chronicles appear appropriate for their purpose. They display, by maps and explanatory notes, the location of persons and events; they show the beginnings and ends of major activities, and they approximate every teacher move during an entire classroom day. If one wishes to study and reflect upon the happenings of one day of a third grade classroom, the chronicles are useful.

An essential assumption underlying use of the chronicles is that teacher behavior, properly recorded and properly supplemented, can yield a comprehensive picture of a total classroom behavior setting. The research effort made this assumption and has established meaningful relationships as a consequence. However, explanation of why teacher behavior can be used to portray a whole setting is in order. In the classes studied, teacher behavior was ubiquitous; few activity changes of consequence occurred without her involvement. Grouping arrangements, activity prescriptions, prop distributions, all came from or through the teacher and therefore, appeared in the record of her behavior. In these classrooms, if one knew what the teacher was doing, he knew the setting's major physical-social constellations. While the research strategy assumed that setting activity could be derived from the activity of the setting manager, the teacher, this assumption cannot be made for all settings, not even all educational settings. One might consider the chemistry teacher who grades papers in his glass-enclosed cubicle while his pupils work just outside in the laboratory; the chemistry teacher's behavior at the moment would not yield a comprehensive picture of the laboratory behavior setting.

Only by an analysis of the action position of the setting manager can one decide whether or not his behavior can be used to outline and describe the segments of the setting. The third grade teacher's behavior happened to be an adequate source because: (a) no significantly extended activity began or ceased without her signals, (b) explanations of how things would be done were made for activities from which the teacher was to be absent (e.g., seatwork), (c) in most segments, the teacher was not absent but was the major and continuous action source; her questioning, discussing, and instructing behavior was the generating force of the subsettings.

It is important to note that when segments occurred for which the teacher's behavior did not provide an outline of action, observers provided additional nonteacher information. The sense of these nonteacher sphere segments could be later ascertained if the observer entered the following data in his chronicles: names of participants, site and tools employed, and general task-accomplishment behaviors (such as studying, writing, painting or discussing). Facsimiles of major action orienters were useful: copies of worksheet, of blackboard assignments, of reading materials, etc.

Although generally adequate, the chronicles had one obvious insufficiency: the lack of content for those teacher acts which were very quiet and occurred some distance from the observer. Most of these are referred to as handling Individual Problems. While the observers followed the teacher when it was clear that they would occupy a new spatial position for an extended time (as when they set up a reading circle), observers, fearing to disrupt classroom operations, did not generally trail teachers about. For this reason, the contents of some teacher-pupil interactions were not heard. Complete content for all teacher acts could be provided by a wireless microphone worn by the teacher. Such a technique has been described by Herbert and ✓ Swayze (1964).

Segment Identification, Description, and Use

The segmenting process appears to have reliability at least when chronicles are employed; a field test would be a next step. Such a venture should be successful since cues for segments are more clear in the field than in the chronicle; in the field, the movement of people and props, the change of activity is perceptually compelling.

Identification of contained segments was more difficult than identification of major or parallel ones. One improvement may be to demand more extensive or intensive changes for marking contained segments than was required in the present research.

With segments identified, it became possible to describe entire classroom days in terms of their structure, that is, in terms of the pattern of single vs. parallel segments, and undifferentiated segments vs. those with contained segments. Variability of segment structure was limited among the classes studied; therefore, a test of the promise of this aspect of environmental description was not possible. However, it would appear that certain dimensions of structure can vary across educational environments. It may be recalled that the outlines of activity in the third and fourth grades of the summer school exhibited rather sharp structure contracts; segments of the third grade more frequently operated simultaneously and were of shorter duration.

A reasonable speculation is that differences in segment structure might have implications for the cost and the yield of educational effort. For example, perhaps a one-segment-at-a-time, or en masse, organization is simpler and takes less managerial and organizational effort than one with parallel or simultaneous segments. Yet data from the present study indicate that such structures also mean less pupil involvement, probably because participation opportunities are spread among a large group. A second structural hypothesis is that segment sequences which show many contained segments provide more environmental variety and less pupil satiation than sequences without contained segments.

Description of segment qualities provides another, more content-oriented method of portraying the classroom behavior setting. Again, in the present case, classes did not differ greatly but there were some distinctions. For example, some classes used up more of the pupils' time in procedural segments than did others; some classrooms presented more social-relaxation segments than others. The segment description of the six classes provides a base against which other classes can be compared. These descriptive results will not be recapitulated here except to emphasize two general findings:

> Pupils were placed in reasonably active and social segments only when the teacher was active in these segments; pupils spent one-third of their time in the nonsocial, minimal action, seatwork segments.
>
> The teacher occupied an active key role for most of the classroom time.

Differences between educational regimes can be expressed by segment description and it would seem that such description provides a necessary link between the more ecological vs. the more behavioral variables. For example, if one wants to know the effects of increasing class size upon pupil motivation and learning (number of pupils per classroom), it would be important to know what the size increase does to the segments in the classroom. For example: Does a larger class necessitate a more en masse segment structure? If pupil motivation in larger classes is low, the changed segment structure may be the reason. The use of the extra-individual unit in tracing out effects from social-institutional variables to pupil behavior seems not only useful but necessary for understanding. Even when correlations between increased class size and poorer learning are established, the way the variables are related cannot be understood until the linkages between the size variables and the pupil reactions are identified. Changes in segment organization may provide the requisite linkage.

The particular dimensions employed to describe segments are those which the investigator felt might make a difference: the business or concern of the segment, the leadership role of the teacher, the grouping of pupils, the kind of activity and its pacing. Other dimensions for segments can be developed. At this point, it may be sufficient to point out that the dimensions here are quite action oriented. More traditional conceptualizations referring to "information," "communication" or "measages" have been avoided. The investigator has assumed that "what's happening" is a more primary question than "what is the meaning of this or that communication." Detailed analysis of communication is better undertaken after the segment structure and content are understood; such an analysis benefits from ecological anchorage.

Teacher Behavior and Aspects of Segments

Teacher behavior was related to aspects of the segment description and a number of relationships were demonstrated:

1. Teachers worked hard; they engaged in almost 1300 acts per day. The nature of the segments seemed to require that some leader take many actions. Since the only leader of consequence in the third grade was the teacher, she was very busy.

2. Certain segment types required much more activity than others. For example, Recitations demanded almost six acts per minute; Reading Circles, four;and Supervised Study, two. (Figure 2) The implications of the foregoing for relief of teacher business are obvious; if the teacher is to have more time free to help individuals or to develop a program (rather than simply enact it), she must change segment types.

3. Segment type and kind of teacher acts were clearly associated. Some associations were obvious reflections of the required or constituent performances which a teacher must carry out to create the segment. Teaching acts came at very high rates in Recitation but not in Music. Other associations were less obvious. Structuring Behavior was prominent in Music but low in Reading Circle; Dealing with Deviating Behavior tended to be high in Music and low in Reading Circle. (Figure 3)

4. Phases of segments (base vs. transition) were especially associated with teacher behavior. Again, some associations were simply descriptions of what a teacher must do if she manages a transition; high percentages of Structuring Behavior exist at Transitions. Other associations were less dependent upon the program of the segment phase; Dealing with Deviating Behavior, for all teachers, was concentrated in the transition phase. This finding justifies Kounin's selection of transitions as ecological phases in which a teacher's managerial competence is especially tested (see p. 7)

Another type of transition phase was represented by the Leaving segments; teachers were called upon for much Handling of Individual Problems during these periods. Apparently the Leaving segments present brief periods when the teacher can provide some individual attentions not feasible during more demanding segments. Extent of concern for the interests of individual children might be particularly well measured during Leaving segments.

In general, the findings on teacher acts in relation to kind and phase of segment support a basic research proposition: the teacher's behavior is both generative of and responsive to sections of the classroom environment.

Pupil Behavior and Aspects of Segments

Segment type and phase are also important in determining aspects of pupil behavior. How much a pupil is involved in the work at hand depends upon the segment he inhabits. Data indicate that segment variables were more important in this respect than person variables.

The surge and decline of pupil involvement can be graphically coordinated to kind and phase of segment. When this is done, the relation of ecological variation to individual behavioral variation is clearly represented. Statistical tests of the observed relations showed the following:

1. Pupil involvement was greater when the pupil's activity was externally paced rather than self paced.

2. Pupil involvement was greater when the pupil worked with the teacher in small, rather than total class, interdependent groups.

3. Pupil involvement was greater when pupils attended to teacher and/or to each other's short contributions rather than to extended peer presentations.

Having some task to do along with class recitation was presumed more involving than merely attending to recitation; the data did not support this hypothesis. Also, the teacher's presence in segment was presumed more coercive of involvement than her absence; however, students were not significantly more involved when studying with the teacher's presence in Supervised Study than when studying without it. The reasons for the relatively low involvement in Supervised Study were not discerned in the research data; however, there are tendencies for children of this age to seek teacher's help; if they see it is available, they often cease work while waiting for that assistance. This behavior might have lowered the involvement scores in the Supervised Study segments.

Although two of the five hypotheses about involvement were not supported, the other three were firmly demonstrated; the relation of pupil involvement to segment type can be considered established.

Segment phases and pupil involvement also yielded strong relationships. Beginnings of segments showed less involvement than the remainder of the segments, but involvement was particularly low for the beginning (or resumption) of self-paced, as opposed to externally-paced, segments.

Pupil resting and self-touching behaviors were associated with segment type. However, the common sense idea that these behaviors are reflections of withdrawal and noninvolvement did not gain clear support. Self-touching seems most clearly related to the absence of other objects for touching.

The data for pupil involvement suggests that the teacher has different pupil motivational problems in different kinds of segments. For example, although Pupil Presentations supposedly represent valuable social experiences, the data indicate that audience pupils, in these classes, were less than enthusiastic. The data for self-paced segments indicate that pupil effort may need special support during the beginning or resumption of these periods. It seems reasonable to assume that long application without a break produces satiation and lowered pupil involvement, but present data indicate another side of the story: beginnings or resumptions have their noninvolvement costs also.

A Problem ...

The data for teacher acts, for pupil involvement, and for segment qualities taken together point to a bind existing in these conventional classrooms. The problem may be stated as follows:

> Pupils are more involved in externally-paced segments; teachers provide this external pacing. To encourage more involvement by way of more external pacing, teachers will have to become more active. But, teachers are already highly active, perhaps at the upper limit of their potential. Furthermore, the very best involvement comes with external pacing in small interdependent groups. The teacher provides the key action in such groups, and to maintain the group, she must put another larger group of pupils in nonsocial, self-paced segments where involvement is low.

Clearly there is no way out of the problem if external pacing must rest on the teacher. The problem is how to create stimulating, involving segments which do not depend upon continuous teacher support. If teacher support is required, the segmental structure will continue to show what it showed in the present study: either en masse single segment operation or parallel segments. One segment is then active, involving (and teacher-led), and the other becomes a kind of "being kept on ice" arrangement called Seatwork.

Actually, two problems are involved here: the one relates to guidance of the teacher-absent segment, and the other to possible intrusion of any segment which becomes active and social upon other segments. While it is not the province of this research to solve these problems, it can be observed that guidance for a teacher-absent segment might be provided by educational hardware or by well-learned cooperative regimes; intrusion is less when sound proofing (acoustical tile, carpets, etc.) and moveable screens are provided.

Regardless of the solutions, the presented data suggest some of the problems that exist when segment structure is so dependent upon continuous teacher activity. Improvement in classroom learning may come more from changing this situation than from attempts to increase the motivation and skill of teachers for work in traditional segment environments.

CONCLUSIONS

Conclusions drawn about exploratory research are directed to considerations of promise rather than to matters of proof. Perhaps the basic conclusion to be sought for the present investigation is whether or not educational research guided by concepts and methods of ecological psychology will be fruitful. Do the methods and results reported here give confidence that study of settings and subsettings will yield intellectual command of classroom phenomena?

In seeking a conclusion, one may ask whether the phenomena of subsettings, or segments, are as compelling as the investigator contends. The first research answer is that these units can be reliably discriminated, in records, by independent research analysts. (Teachers and pupils have been discriminating them for a long time.) The segments are real enough; the question arises, are they important? This investigation demonstrated that teacher behavior and pupil behavior vary meaningfully with changes in segment type. Some of the variance reflects the obvious fact that certain behaviors are constituent to the segment. A teacher must ask questions in a recitation. But other significant behaviors are reactive to segment qualities, not merely necessary parts of these qualities. Teachers' handling of Individual Problems is not constituent to Leaving segments but these segments seem to evoke much of such behavior. The amount of pupil involvement also varied according to segment type; thus variation represented reaction to segment events rather than direct constituent behaviors. Pupils and teachers change their behaviors as they change their segments.

Useful concepts led to further concepts; once segments were identified, curiosity regarding events at the beginnings and ends of segments naturally followed and work with transitions began. The present research demonstrated the behavior-influencing capacity of the transition parts of the segment structure. Further, transitions and segment types seem to interact; for example, beginnings (or resumptions) of self-paced segments have particularly low involvement scores. In view of these developments, it seems fair to contend that segments are sufficiently important to merit close attention.

The capacity of the segment approach to generate new attention points, new research possibilities, is also illustrated in the measurements of pupil occupancy time in segments of various qualities. With these tools it is feasible to quantify the relative dominance of various qualities in the classroom environment. The extent to which children are contained by environments which encourage interdependent activity, or self pacing, or action beyond attention and talk can now be stated with some precision. Furthermore, such measurements can be achieved without close checks upon each individual child's activity. As the description of the classroom environment via segments and occupancy time becomes developed, the relating of hitherto disconnected variables is improved. For example, in-training programs for teachers are sometimes evaluated in terms of change in pupil interest or achievement. What happens in the classroom between the training and the change in the pupil is often not investigated. An effective training program should lead to a different classroom environment which, in turn, should lead to pupil changes. Changes, or lack of them, in classroom environments can be measured.

The study has emphasized that segments can serve as a source of independent variables; the preceding example shows segment variables as intervening; it is a short step further to segment structure as an area of dependent variables. The question of what encompassing phenomena such as changed administrations, new pupil populations, innovations in educational technology and building design do to classroom operations needs to be answered. Most existing methods do not, cannot, answer such questions. Test scores or attitude surveys are too far away from the impinging variables; they, in a sense, show the final personal residue; they don't suggest how (i.e., by what specific environmental changes) this residue occurred.

Next Steps

If the present investigation provides some confidence that development of an ecological psychology of the classroom is feasible and promising, it also leaves unfinished tasks. The segmenting concepts and methods have been developed for self-contained, somewhat traditional third grades. The chronicles have the scope that only full-day recording can yield, but beyond this they are limited. How segmenting would be carried out in a platoon system or in a classroom of many separate and simultaneous action arenas has not been established. However, perhaps enough has been done to encourage research on classrooms which delineates the extra-individual action units which serve as anchorage for more molecular teacher and pupil acts. Constellations of temporal spans, sites, objects, participants, activity formats and concerns are compelling patterns in all varieties of classrooms. Uncertainties do arise about just how prolonged and how delineated these patterns must be before they are accepted as segments. Most of these uncertainties can be settled by examination of the actual cases and reflection upon alternative sets of criteria for segment unitization. Whether or not the uncertainties are worked through probably depends more upon the conviction of the researcher that the unit is useful or necessary than upon intrinsic difficulties in the approach.

A second direction of effort relates to pupil variables. The variable of involvement used in the present research had the advantage of discriminability and moderate relevance to the central classroom issue, that of learning. Other pupil behaviors should be checked. For certain segments, productivity per time unit is a reasonable measure. Another pupil variable is motivation toward a learning area; for example, what sort of action structures stimulate interest in a subject matter, create a desire to do more with the area? There must be segmental arrangements which enhance or retard various kinds of learning. For example, reading circles usually produce high pupil involvement. Are children also learning better because of this small, interdependent, close-to-teacher externally-paced segment? Or would a different arrangement yield faster learning?

A final and most important area is the development of theory regarding the relation of educational outcome variables to variations in the realm of ecological psychology. On a school-wide basis, a start in this direction has been made by Barker and Gump in Big School, Small School (1964). But very little has been done for the classroom per se. The investigator is not prepared to outline such a theory but would like to offer several principles regarding the classroom which appear realistic to him:

1. The theory, in its beginnings, should be close to the phenomena to be explained. The theory should flow from "what's happening," not from other available theories. Sociometric or learning theories may be pertinent to the classroom; in the investigator's opinion, they do not and they cannot describe the basic structure of the classroom operation. There is an unfortunate tendency to employ methods and concepts simply because they are there. Classroom research, in particular, has suffered from this research timidity.

2. An adequate theory of classroom functioning will recognize that the phenomena form an action system. Communication systems, sociometric systems, teacher-pupil attraction-repulsion systems, and reward-nonreward systems are also involved; however, each is a particular aspect or development of the comprehensive action system.

3. In view of the system nature of classroom operations, exhortations to understand (in the psychological diagnostic sense) each individual child seem out of place. The problem is understanding and developing action systems which give scope to children's need to do and to learn. Teachers are in the business of generating and maintaining appropriate learning environments; in this endeavor emphasis upon personality diagnosis has limited usefulness.

4. The classroom system resembles a machine. Adjustments in one component affect functionings of other components. Too extreme a change in one component results in mechanical failure. There are degrees of changes which a particular kind of classroom machine can make and others which it cannot. Even "good changes," if extreme, can unbalance operations. For example, a few incidents recorded in the chronicles indicated that segments which presented mildly interesting objects and activities, yielded increased pupil involvement. But several segments with truly fascinating objects and activities became chaotic. Strange as it sounds, the traditional classroom may not be able to operate with highly motivated students. The general blandness of the educational activity diet is no accident; such a diet yields children who mesh nicely in the educational machine. If the diet is to be changed, the system must be changed. One of the challenges of educational research is to learn how to create a segmental system which encourages--and survives--high interest in its inhabitants.

SUMMARY

This exploratory investigation sought development of concepts and methods for description of the classroom behavior setting. Following principles and techniques from the field of ecological psychology, the investigator attempted to identify ecological subunits within the classroom setting and to specify the qualities of these subunits. Once developed, the system was employed to make quantitative descriptions of the environments inhabited by a sample of third-grade school classes. In order to assess the educational relevance of the system's measurements, relationships between these measurements and teacher and pupil behaviors were analyzed.

The research strategy involved development of narrative records or chronicles which displayed the events of the behavior setting over entire classroom days. The chronicles were based upon on-the-spot dictation of observers using a Stenomask-Dictet assembly. They included all teacher moves, the location and activity of subgroups, and other information necessary for a comprehensive picture of the classroom's operations. Two full-day chronicles were constructed for each of six third-grade classes. Classes themselves were selected to yield a range along the dimensions of pupil academic aptitude, teacher managerial skill and novelty of lesson presentation. By review of the chronicles, it was possible to learn what reasonably homogeneous environmental subunits existed in the classrooms and how these might be identified and described.

The chronicles yielded detailed information about teacher behavior; for example, almost 1300 teacher acts were recorded in a typical day's chronicle. However, pupil behavior was not detailed in the chronicle (except as it occurred in direct teacher-pupil interaction). Time-lapse photography was used to supply information regarding pupil behavior throughout the classroom day.

The subunits of the classroom environment which became targets for research analysis were labelled segments. Examples of segments included Morning Ritual with Flag Salute and Song, Far and Near Reading Group, and Milk and Story Time. Analysis of segments showed that they were clear ecological units; they could be identified by temporal and spatial boundaries within which were the behavior objects, participants, activity formats and businesses (or concerns) which gave the segments their identities. Actions within one segment were highly interdependent; actions occurring in separate segments tended to be independent. Throughout a classroom day, a series of segments appeared; teachers and pupils inhabited a sequence of segments. Segments were identified from chronicles and were marked on the chronicle record; all teacher-pupil behavior fell into one segment or another. Thus, the relationship between environmental units (segments) and inhabitant behavior could be examined.

The identification of segments was tested and reliability proved satisfactory. With the classroom day divided into segments, it became feasible to represent, to "map," the segment structure of the day. At

At certain points, single en masse segments prevailed; at others several segments operated simultaneously. The segment map also represented the difference between prolonged homogeneous segments and those which produced sufficient internal differentiation to yield contained segments. The segment map was presented as one method of diagramming the classroom environment. Major differences between educational environments can be represented by such diagrams.

Segments presented activity content as well as structure. Reflection upon events within these units leads to development of a code for segment qualities. The following five different category sets were established to describe the nature of the various segments:

1. Concern	With what business is the segment concerned? Arithmetic? Music? Procedures for dismissal?
2. Teacher Leadership Pattern	What action role does the teacher take in relation to segment maintenance? Watcher-Helper? Recitation Leader? Instructor?
3. Group Quality	Do participants in the segment function interdependently or in a private fashion? Is the total class or a part of the class involved?
4. Pupil Activity	What kinds of perceptual and accomplishment prescriptions are typical of the segment? Attention to own seatwork? Attention to larger arena? Is only incorporation of material involved or must something more overt and tangible be accomplished?
5. Action Sequencing	Do participants pace themselves or is there external pacing? Is the pacing relevant to attention only or to task accomplishment also?

Reliability of coding with the category sets was satisfactory. With establishment of the category sets, it was feasible to describe the content of the classroom environment as well as its structure. Description was made for the six classes under study by use of a pupil occupancy time index; that is, the relative importance of particular segment qualities was expressed in terms of the total amount of pupil time spent in segments possessing that quality. Following are examples of the allocation of pupil time in the six third grades studied:

1. Academic segments took over 72 per cent of the time of these third-grade pupils; it seemed surprising that procedural segments (getting in and out of the room) required a total of 12 per cent of the pupil occupancy time.

2. Pupils spent 60 per cent of their time in segments in which teacher action was central, 40 per cent in segments in which it

was not. Although the teacher was quite active, she did not simply expound and let the children absorb; this Instructor leadership pattern required only 3 per cent of the pupil occupancy time.

3. Classroom environments in these third grades emphasized socially interdependent as opposed to private patterns. The private pattern prevailed in only 33 per cent of the pupil occupancy time.

4. Pupil activity, as prescribed by the segments pupils inhabited, tanded either to be restricted to seatwork tasks or to recitations in groups; 73 per cent of pupil occupancy time was devoted to such relatively bland activity. Activity involving more vigorous and expansive motoric and social action was not well represented in pupil occupancy time.

5. Self pacing of behavior was prescribed for segments requiring 40 per cent of pupils occupancy time. Since self pacing yields special problems of pupil involvement (see page 45), this amount has significance.

6. Analysis of various segment action structures revealed that pupils might be active and social if the teacher was at the center of segment action; if she was not, pupils would pursue private endeavors of a relatively inactive type. Socially interdependent and active segments without central teacher leadership were very rare.

Segments and Teacher Acts

All observed teacher acts directed to students became a part of the chronicles. These acts were subjected to a code and the following four major clusters of teacher activity were developed:

Teaching Acts (the pedagogical effort of recitational queries, feedback for answers, offering of knowledge),

Structuring the Behavior and Behavior Object Pattern (activity directed to moving persons and props, to signaling beginnings and ends, and to requesting changes of attention),

Dealing with Deviating Behavior (attempts to make pupil behavior more energetic or more careful, or to block or counter undesirable behavior),

Individual Problems (quiet dealing with pupils; content was not heard by observer but context suggested that special needs and problems were being handled).

The segment qualities were represented by five common segment types: Seatwork, Supervised Study, Recitation, Reading Circle, and Music. The relationship between these segment types and teacher acts were analyzed. Certain associations were explicitly required by the nature of the segment; they represented teacher behavior constituent to the segment. For example, the action position of the teacher in a Recitation (total class) would lead to a prediction of more acts per minute here than in the average segment. And the data show that teacher acts were emitted at a rate of almost six a minute in Recitation as opposed to an average of four a minute. Furthermore, a high proportion of Teaching (i.e., pedagogical) acts was expected for Recitations; an expectation which was amply confirmed.

But some associations between teacher acts and segment types were not simply reflection of what the segment explicitly required. For example, the action position of the teacher in Recitation (total group) and in Reading Circle (subgroup) is very similar, yet significantly fewer acts were emitted in the Reading Circle. It was as if the larger group demanded more continuous teacher input and response.

Kind of teacher act was also associated with segment type; Structuring Behavior was significantly higher in Music than in other segment types.

Segment Transitions and Teacher Acts

Experience with the data made clear that the periods of changeover in the segment sequence were associated with variations in teacher behavior. Much teacher effort goes into these transitional spans; an average of 16 per cent of the teacher acts occurs during transition phases between classroom segments; this does not include another 10 per cent of teacher acts which occur during the Leaving segments--transitions between in-class and out-of-class environments. Structuring Behavior was constituent activity for the teacher during Transition and Leaving periods; results showed that this cluster of acts did dominate these phases. Dealing with Deviating Behavior was not, however, constituent to transitions yet the per cent of Dealing with Deviating Behavior rose at transitions for each teacher observed.

These and other analyses of teacher acts in relation to segment phase, adequately demonstrated that the teacher responds to the segment she inhabits; her behavior does reflect the demands and pressures which the segment generates.

Segments and Pupil Behavior

The involvement of pupils as revealed in the time-lapse photography was coordinated to aspects of segments. For example, graphic representation displayed pupil involvement percentages in relation to the segment sequence. Complete day graphs for each classroom were devised. Inspection of the graphs led to post hoc speculations about the relation of qualities of segments and amount of pupil involvement. When these speculations were subjected to statistical test, the following was demonstrated:

1. All segment types with external pacing yielded significantly better pupil involvement than segment types with self pacing. (Reading Circle, Recitation, and Instructing $>$ Supervised Study and Seatwork, $p < .01$)

2. Small groups with the teacher in a central action role yielded better involvement than total class groups with teacher in the same role. (Reading Circle > Testing, Recitation, $p < .01$)

3. Segments which involved prolonged pupil presentations (reports, sharing) yielded significantly less pupil involvement than did other externally-paced segments which did not include extended pupil contributions. (Pupil Presentation < Reading Circle, Instructing, Testing, Recitation, $p < .01$)

Segment Transitions and Pupil Behavior

Just as teacher act behavior was significantly related to transitions between segments, pupil involvement reflected conditions pertinent to segment change. The relation of pupil involvement to beginning (or resuming) phases and to the remaining phases of two segment types was examined. Results of the analysis demonstrated that beginnings or resumptions yielded depressed pupil involvement scores; however, these involvement scores at the beginning or resumption of self-paced segments were much more depressed than at the beginnings or resumptions of externally-paced segments ($p < .01$).

The association of teacher and pupil behaviors to measurements based on segment structure indicate that description of the classroom environment in terms of these ecological structures is a promising, perhaps essential, approach in educational research.

Next steps in the development of the ecological psychology of the classroom include a broadening and a formalization of the system here proposed; effort to relate aspects of the segment environment to pupil behavior variables beyond involvement; and development of theory of ecological psychology particularly relevant to issues of learning.

Bibliography

Adams, Raymond S. A Sociological Approach to Classroom Research. Unpublished report. University of Missouri, Department of Psychology. 1967. 32p.

Barker, Roger G. "On the Nature of the Environment," J. Soc. Issues. 1963. 21. No. 4, p. 17-38.

Barker, Roger G.; and Gump, Paul V. Big School, Small School. Stanford: Stanford Press. 1964. 250p.

Barker, Roger G. Introduction to Ecological Psychology. Methods and Concepts for an Eco-behavioral Science. Stanford: Stanford Press.

Barker, Roger G.; and Schoggen, Phil. A Quantitative Study of Environmental Change over a Decade within an American and English Town. Final report, National Science Foundation. 1967.

Barker, Roger G.; and Wright, Herbert F. Midwest and Its Children. New York: Harper & Row. 1955. 532p.

Biddle, Bruce J. Recent Research in Classroom Behavior. Unpublished report, University of Missouri, Department of Psychology. 1967. 35p.

Dyck, Arthur J. "The Social Contacts of Some Midwest Children with Their Parents and Teachers." In R. Barker (Ed.), The Stream of Behavior. New York: Appleton-Century-Crofts. 1963. p. 78-98.

Gordon, Ira J. Studying the Child in School. New York: John Wiley & Sons. 1966. 145p.

Gump, P. V., and Kounin, J. S. "Issues Raised by Ecological and Classical Research Efforts," Merrill-Palmer Quart. 1959-60. 6. p. 145-152.

Gump, P. V., Schoggen, P., and Redl, F. "The Behavior of the Same Child in Different Milieus." In R. Barker (Ed.), The Stream of Behavior. New York: Appleton-Century-Crofts. 1963. p. 169-202.

Gump, P. V., Schoggen, P., and Redl, F. "The Camp Milieu and Its Immediate Effects," J. Soc. Issues. 1957. 13. No. 1, p. 40-46.

Gump, P. V., and Sutton-Smith, B. "Activity-setting and Social Interaction," Amer. J. Orthopsychiat. 1955a. 25. p. 755-760.

Herbert, John. A System for Analyzing Lessons. New York: Teachers College Press. 1967. 131p.

Herbert, John; and Swayze, John. Wireless Observation. New York: Bureau of Publication, Teachers College, Columbia University. 1964. 33p.

Hughes, Marie M.; and Associates. Assessment of the Quality of Teaching in Elementary Schools. Unpublished report, Cooperative Research Project No. 353, Office of Education, U. S. Department of Health, Education, and Welfare. 1959. 314p.

Kates, R. W., and Wohlwill, J. F. (Eds.) "Man's Response to the Physical Environment." In J. Soc. Issues. XXII, 1966.

Kerkman, D. H. Behavior Settings at School in Communities Differing in Size. Doctoral dissertation, University of Kansas, 1963.

Kounin, Jacob S., Friesen, Wallace V., and Norton, A. Evangeline. "Managing Emotionally Disturbed Children in Regular Classrooms" Journal of Educational Psychology. LVII, 1966. p. 1-13.

Kowatrakul, Surang. "Some Behaviors of Elementary School Children Related to Classroom Activities and Subject Areas," Journal of Educational Psychology. 1959. 50. p. 121-128.

Lewin, Kurt. Principles of Topological Psychology. New York: McGraw-Hill. 1936. 231p.

Raush, H. L., Dittmann, A. T., and Taylor, T. J. "Person, Setting, and Change in Social Interaction: II. A Normal Control Study," Human Relat. 1960. 13. No. 4, p. 305-332.

Schoggen, Phil. "Mechanical Aids for Making Specimen Records of Behavior," Child Development. XXXV, September 1964. p. 985-988.

Wright, H. F.; Barker, R. G.; Nall, J.; and Schoggen, P. "Toward a Psychological Ecology of the Classroom." In A. P. Coladarci (Ed.), Readings in Educational Psychology. New York: Dryden Press. 1955. p. 254-268.

Appendix A

Sample Excerpts from Chronicle

Mrs. Apple's Third Grade

The official school day begins at nine o'clock. The children arrive a few minutes early; some mingle quietly with each other, but most of them sit down at their desks and take out their school materials. Mrs. Apple encourages this by reminding them that they are to be ready for work when the bell rings. She leaves the room to help one boy telephone home and then returns to sit at her desk, correcting papers.

The final bell rings.

Mrs. Apple begins the day by saying "Good morning, boys and girls" and they respond in unison. They spend a few moments socializing after which they recite the Pledge of Allegiance and sing "America."

The next ten minutes are spent in Currents Events. Today Danny's row will present the news stories and Danny begins by coming up to the front of the room. His news story is about a horse and a rider swimming and he shows the class a picture of this event. All the children in the row take their turns except Leigh Ann, who forgot her article. Each of them puts his article upon the bulletin board. The whole class is involved in this learning period, as they volunteer background information for each news story.

Mrs. Apple now begins to structure the school day by going over the morning work schedule. She will spend most of the morning working with individual reading groups. When students are not part of a reading group, they are expected to work with reading worksheets at their desks. If these are finished, then there is spelling, multiplication, etc. Having answered several questions, Mrs. Apple continues...

⑥

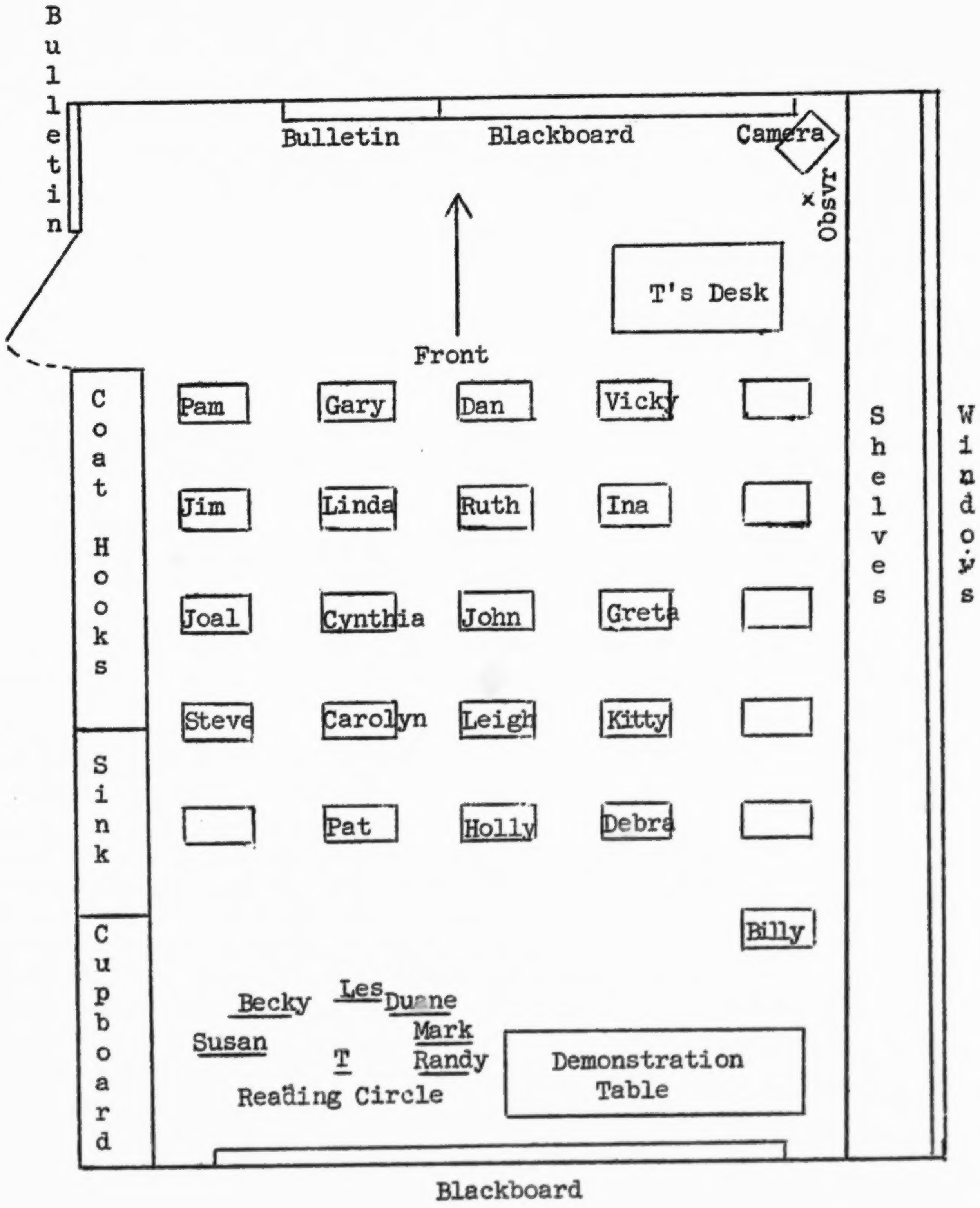
Morning Seatwork

...T says, "Now, will everybody get busy, please, very quickly?"

T asks Becky to set up the reading circle.

31:45 Becky begins to set up the reading circle at the back of the room.

Mark and Duane are also at the back of the room, looking at the spelling words on the blackboard.


Bulletin
Bulletin
Blackboard
Camera
x Obsvr
Front
T's Desk
Coat Hooks
Sink
Cupboard
Shelves
Windows
Pam
Gary
Dan
Vicky
Jim
Linda
Ruth
Ina
Joal
Cynthia
John
Greta
Steve
Carolyn
Leigh
Kitty
Pat
Holly
Debra
Billy
Becky
Les
Duane
Mark
Susan
T
Randy
Reading Circle
Demonstration Table
Blackboard

Mrs. Apple's Third Grade Classroom

⑥ Morning Seatwork

⑦ Friends Far and Near Worksheet Directions

T then takes some papers and hands them out to Leigh Ann, Ina, Greta, Vickie, Debra, Kitty, and Ruth.

33:00 T says, "Friends, Far and Near, I want your attention. Pages 53 and 54." (See Supplementary Material)

T urges, "Ina, quickly."

T is in the middle of the room now. She walks back to Kitty and says, "Honey, we will not use that," and makes some other comments.

O cannot hear the comments.

T backs up to the front of the room.

T, rather perturbed, again urges, "Quickly, Ina."

Then T goes over to Ina and helps her tear out two pages from her booklet.

Ina finally gets them torn out.

T says, "All right, good!"

T says, "Now I want to talk to all of the Friends, Far and Near."

T asks Billy to read the directions from page 53.

Billy reads these directions.

Billy finishes.

T says, "Now these are the questions about our story. Now, these are true and false and that's not too hard."

T cautions, "Now let's not work until we're finished with our directions."

T continues, "Now read the directions for the next section, Debra."

Debra reads.

35:10 T says, "All right, now we've talked about hard and soft sounds. Again I will go over the word 'sit.' The sound is hard or soft?"

So the students in this reading group say, "Soft."

⑥ Morning Seatwork

⑦ Friends Far and Near Worksheet Directions

T says, "That's right. Now we've talked about this on other letters, haven't we? In the word 'these' we have the hard sound. Now put them in their proper column depending on hard or soft."

Vickie has her hand raised and has a question.

T recognizes her.

Now Ina has her hand raised but she puts it down.

T says, "Page 54, Billy, page 54."

T continues, "Ina, would you read the directions on page 54."

Ina reads them.

36:20 T says, "All right now, what is a compound word? We've done some work in our reading groups on compound words."

Ruth raises her hand.

T asks her.

Ruth answers.

T says, "All right, good."

T then says, "Does everyone understand what to do?"

They nod their heads affirmatively.

T says, "At the bottom of the page we have some syllable and accent work but we worked on that yesterday and I don't think you'll have any trouble with that."

Debra raises her hand and says that she doesn't understand something.

So T says, "All right, let's talk about that again. Let's do this first compound word together. Draw a line between each of the two words below to make a compound word."

T asks Leigh Ann what the word is.

Leigh Ann answers.

⑥ Morning Seatwork

⑦ Friends Far and Near Worksheet Directions

T says, "What word will you draw a line to, to make it a compound word? Raise your hand when you find it."

There are a number of hands up--Billy, Debra, Greta, Leigh Ann, Vickie, Ruth.

T is waiting for them.

T then says, "All right, what would it be, Greta?"

Greta answers.

T says, "All right, good. Now who can put that in a sentence for me? Debra?"

Debra has her hand raised.

Debra puts it in a sentence.

T says, "Fine, that's right. Now would you draw a line between 'shop' and 'keeper'?"

T says, "Now, let's let Ina do the second one. What's the second word, Ina?"

T says, "Can you find the word that will make this a compound word?"

Ina answers very softly.

T says, "Billy, can you hear her?" Billy's desk is at the back of the room.

Billy says, "No."

So T says, "Ina, talk more loudly, please."

Ina answers more loudly.

T says, "Who can put this in a sentence?"

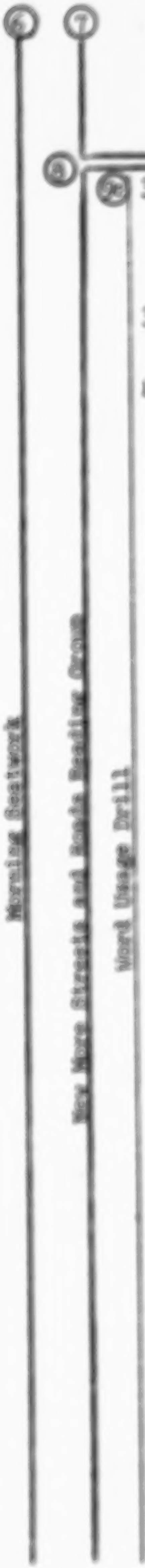
Billy raises his hand.

T asks Billy.

Billy uses the word in a sentence.

T says, "Good."

T then says, "Are there anymore questions?"



T continues, "All right, go to work on these pages and they'll be due this morning."

The students begin to work.

39:25 T comes over to her desk and says, "New More Streets and Roads, why don't you just come back for a little bit without your books and we'll practice our game."

39:30 The students begin to gather at the back of the room in the reading circle.

40:00 T asks them to move their chairs a little bit so that they can see.

T says, "Who would like to be the leader? Becky?""

Becky comes up to the blackboard and points to a word on the blackboard with a pointer.

Some of the students answer but none of them have done it correctly yet.

So T goes to the blackboard and goes over it by syllables.

The students answer as a unit--they answer all together.

T then says, "Can you use this in a sentence for me, Danny?"

Danny has his hand raised.

T says, "Good, that's good."

T goes on, "Becky, quickly, see how fast you can go."

Becky points to the word "blinked."

There are two hands up.

One of the boys pronounces it.

Becky points to the word "squeeze" and asks Susan to pronounce it.

T can't hear Susan the first two times that she pronounces it and asks her to talk louder.

Finally T hears her on the third attempt.

Now she points to another word and asks Les what this word is.

Les gets it correctly.

⑥ ⑧ (9c)

Morning Seatwork

New More Streets and Roads

Word Usage Drill

Becky points to another word, and T. says, "Now let's see if we can pronounce a word and then use it in a sentence."

Becky points to "ashamed" and asks Randy.

Randy pronounces it correctly and uses it in a sentence.

Becky points to another word and asks Mark.

Becky points to another word.

There are several hands up.

Becky calls on the third boy from the left (Duane).

Duane uses it in a sentence.

T says, "What is 'attire'? How do you use it real well in a sentence?"

Les answers.

Randy makes a comment.

T says, "Why don't we change leaders? Becky, would you choose a leader?"

Becky chooses Susan for the leader...

(This activity continues for fourteen minutes in the following fashion: Susan chooses Duane as the next leader and he continues in this role for awhile; Mrs. Apple, then, takes over for a rapid review sort of session. At first the group pronounces words in unison; then the teacher begins calling on individual children. The actual record is now resumed.)

Morning Seatwork

New More Streets and Roads

Word Usage Drill

...T then switches to Susan.

Susan has trouble with one word, the word "rapidly."

T. says, "Can you help us with this word, Les?"

Les does so.

T goes over to the blackboard and writes the word "rapidly" on the blackboard.

T says, "And can you tell how this word was used in our story?"

⑥ ⑧ ⑨

Morning Seatwork

New More Streets and Roads

Word Usage Drill

Les again answers.

T comes back to the word "rapidly" and points to it three times having them say the word three times.

T now continues to point to the words randomly asking Becky to pronounce several of them now.

Now she asks Duane and she points to several of the words on the blackboard.

Duane has trouble with the word "ashamed" so T goes over to the word and points out the number of syllables and goes over the word with him, syllable by syllable.

Duane gets it correctly, then T continues.

T then asks Mark to go over several of the words.

T then asks them to return to their seats.

T adds, "Get your books."

57:10 T then says to the seatwork students, "Children, we will not do art activities that cause noise for the reading circle; that will have to be in the afternoon."

She adds, "See, it is not listed on our board, is it?"

T continues, "Unless you have a project right at your desk or over at the shelf, let's not be back here disturbing our readers, please."

She goes on, "I am watching to see how many students remember that we are working at our seats, please."

57:45 Most of the students in the New More Streets and Roads group come back to the reading circle with their books.

⑩ (See page two for the seating chart.)

Discuss Story

T says, "Now let's turn to our story for today, please."

(See Supplementary Material)

58:15 T says, "What things did you learn about the baby foxes as far as their habits and customs and appearance, things that you hadn't known before? What information did you learn about the animals in this story, Les?"

⑥ ⑧ 10c

Morning Seatwork

Two More Streets and Roads

Discuss Story

Les answers.

T says, "All right, good. Now we've heard lots about little bear cubs who often play around, but the young foxes did the same things in this story."

T says, "Did they remind you of some boys and girls we know once in a while?"

They nod their heads and say, "Uh huh."

T says, "What were they supposed to be doing?"

Randy has his hand raised and T. calls on him.

Randy answers.

T then says, "What did you think their mothers and fathers wanted them to be doing? It didn't tell us that, but what do you think?"

Mark raises his hand, and T. calls on him.

T says, "All right, that's right."

T says, "Now that just reminds me of little boys and girls; they were still little, though. Now what kind of problems did they get into?"

Les has his hand raised.

T calls on him.

Les answers.

1-00:35 T says, "All right, they would all try to get in the same door at the same time."

Mark has his hand raised.

T recognizes him.

Mark says something, and the children all laugh.

T laughs also and says, "All right, now do you think that there is humor in this story?"

1-00:50 They nod their heads and say, "Uh huh."

T gets up and writes "humor" on the blackboard.

T says, "What did you think was humorous?"

⑥ ⑧ (10c)

Morning Seatwork

New More Streets and Roads Reading Group

Discuss Story

T asks Becky, who has her hand raised.

T then asked if there was any humor in a particular part of the story.

Duane raises his hand to answer.

T calls on Duane.

Duane speaks.

T says, "All right, one said,'I want this one,' and the other one said,'I want that one.' Now didn't you think that was humor?"

They nod their heads and smile and say, "Yes."

T then says, "Now I want you to find some sentences in the story that tell me about the foxes' appearance and habits."

1-01:55 T writes these words on the blackboard. She also writes "food."

T says, "Now can you find any sentences in the story that tell me about these things? Look through your story now; see if you can be a good detective. See if you can find some facts that we can write under each one of these headings."

Les says "Oh," and raises his hand.

T calls on Les.

Les starts.

T then says to some children from the seatwork group, "I'm sorry, class, but it is too hard to hear. Now please tiptoe when you are walking around."

T turns back to the reading circle.

Les continues to read from the particular page--several sentences.

T says, "All right, now where would I put this? Would I put it under Appearance, Habits, or Food?"

T calls on Susan.

Susan says, "Food."

⑥ ⑧ (10c)

Morning Seatwork

New More Streets and Roads Reading Group

Discuss Story

T says, "That's right," and writes the words "gnawed chicken bones" under Food.

As T writes it on the board, she says, "What do they mean 'gnawed'?"

1-04:00 T asks Mark, who has his hand raised.

Mark answers.

T says, "All right, can you find anything else in the story that tells us something about food?"

They begin to look at the story.

T says, "Now, let's skim with the eyes."

Mark finds something and raises his hand.

1-04:20 T says, "Mark."

Mark reads a sentence from a particular page.

Mark finishes.

T says, "That would be under Habits, but that's all right."

T then says, "What should I put down here? How would I say it, writing it in just a phrase and not the whole sentence?"

Mark answers in a phrase.

Randy raises his hand; he has found another sentence.

T recognizes Randy, and he reads several sentences.

T says, "Just a minute, let's let everybody find the correct place."

T says, "All right now, Randy, read that for us, please."

Randy reads.

T says,"All right, where would we put that; what does that tell us about?"

Randy says, "Food."

T says, "Now, what would I put down; what would be a phrase?"

⑥ ⑧ (10c)

Morning Seatwork

New Word Streets and Roads Reading Group

Discuss Story

Randy again answers.

T says, "Good," then writes it down.

T says, "Now, we have quite a bit under Habits and quite a bit under Food, but we don't have anything under Appearance." Let's look for something to put under Appearance."

They look through their story.

T says, "Now, let's be good detectives. Susan, can you help us, too."

Susan says, "I don't know what 'appearance' means"

T says, "Oh, well, let's go over it again. We talked about it, but let's go over it again."

T points to the word on the blackboard and asks Mark what it means.

Mark starts.

Then Les says something without raising his hand.

T points to him and says, "That's right, go on, Mark, let's tell about the rest of it. Give the complete meaning."

Mark can't do this.

T says, "Well, boys and girls, I'm glad that I found out that you didn't know what this word really meant."

T then proceeds to tell them what the word means.

1-07:30 Billy, in the seatwork group, is at Pat's desk.

T says, "Have you gotten all of your work finished, Billy?"

Billy says, "Yes."

T then proceeds to ask him about his spelling, his multiplication facts, etc.

Billy says that he has finished all of them.

T says, "Billy, I think you can use some more study. Now you go back to your desk and study."

⑥ Morning Seatwork

⑧ New More Streets and Roads

(10c) Discuss Story

Billy goes back to his desk, sits down, and takes out a book.

1-08:15 Les has found something to put down under Appearance, which the T is now writing on the blackboard.

1-08:40 T reprimands Susan for not paying attention.

T says, "Now, can't you just see these wildly waving tails of the foxes."

T continues, "Now, let's see if we can find something else about the appearance of the foxes. Scan with your eyes."

Mark suddenly raises his hand and says, "Oh."

T says, "Mark has one. Would you read it, Mark? What page, Mark?"

Mark gives the page and then begins to read.

T then says, "Good."

T continues, "Little balls of fur" and writes this on the blackboard.

T says, "Now do you think that there is anything in that sentence that also tells about their habits? Where do they live?"

Susan, Becky, and Mark raise their hands excitedly.

T calls on Susan, who answers.

T says, "All right."

T goes on, "Now is there anyone who would like to see if they can find three or four more things that they can tell; interesting things to tell us about foxes? Would you like to look up a report about this animal and tell us tomorrow, things that we didn't find in our story?"

Randy says that he would like to do it.

Les says that he would like to help him.

T goes to the blackboard and writes down the names of Randy and Les under a report.

⑥ Morning Seatwork

⑧ New More Streets and Roads

T says, "Now, we will come back to our reading circle right after gym. Our time is almost up, so we will not get our sheets checked."

T adds, "Would you please go to your seats quietly and get on your gym shoes?"

1-11:15 They return to their seats and get their gym shoes out.

T goes over to the cupboard at the back of the room and gets her gym shoes.

⑪ Going to Gym

T says, "Row 2, get your gym shoes out."

1-11:45 T goes to the front of the room.

While T is up at her desk putting on her shoes, Ina comes up and says something to her and then goes back to her desk.

T calls Row 3 to go get their shoes.

1-12:15 T , as she walks to the back of the room to the cupboard, says, "And Row 4."

1-12:30 T walks to the back of the room, looks into the cupboard and says, "Where is my board eraser?"

One of the boys raises his hand, then goes to the blackboard and begins to erase it.

T then signals Row 5 to get their gym shoes.

Billy and Joel, at the front of the room, are talking to T Joel now returns to her seat.

Billy asks T a question. (O couldn't tell whether he got an answer.)

Then two other students ask T a question.

T deals with each.

T then goes over to the door and says, "Boys, would you please line up now."

T says, "Girls, I will need you in your seats now."

T tells Becky to be very careful about carrying scissors. T says, 'Now, remember how we carry scissors."

⑪

Going to Gym

T says, "Shh," to the class.

T then talks to the boys and says, "Now you may go into the gym and get four mats out."

All of the boys except Billy, Les, Dan, and Jim go out of the room.

T calls Row 2 and Row 3 to line up.

T says, "Well, I guess we aren't quite ready yet to line up," and she smiles.

There are several of the students who do not yet have their shoes on in the two rows that she has already called.

Now T calls Rows 4 and 5.

1-15:00 The students are lining up quietly.

T talks to one girl in the row and laughs and says, "What is the matter with you this morning?" T also says something else to the girl.

T says, "Girls, check your hair for pins. Put the pins on my desk."

T says, "Okay, check for other things that might hurt you when you go over when you take the roll."

T says, "Okay, now, I guess we are ready to go."

1-16:00 T says something to one of the girls in the row and comes over and fixes her hair for her.

T then says, "All right, let's go quietly."

T walks out of the room, and the students follow her.

1-16:45 The students are going out of the room slowly, following T.

1-17:00 All of the students have left the room.

End of first morning observation.

Name..

Write Yes in the blank if the statement is true. Write No if it is not true.

Is This True?

---- 1. Lions are friendly and kind.
---- 2. Some bottles have stoppers.
---- 3. A cubby house is large and roomy.
---- 4. You can trip over a tree root.
---- 5. Lions talk to little boys.
---- 6. Lions get thirsty.
---- 7. Lions drink from bottles.
---- 8. Lemonade keeps cold in a refrigerator.
---- 9. Lions can read signs.
---- 10. Lions hunt for places to live.
---- 11. Lions need chairs to sit in.
---- 12. Lions have whiskers.

Say the words below softly and listen to the sound of s. If the s has a soft sound as in sit, write the word in the first list. If the s sounds like z as in these, write the word in the second list.

whiskers
raised
chase
paws
thirsty
mustard
cousin
sandal
thousand
music
loose
numbers

sit		these	
--------------	--------------	--------------	--------------
--------------	--------------	--------------	--------------
--------------	--------------	--------------	--------------

Name..

Draw a line between each of two words below to make a compound word. Write the new compounds in the blanks.

		New Word
shop	selves	....
after	side	....
every	ups	....
in	bell	....
cow	keeper	....
new	born	....
grown	brush	....
your	one	....
torch	light	....
paint	noon	....

Making Compounds

Say the words below softly. Then place an accent mark on the syllable that is stressed in each one.

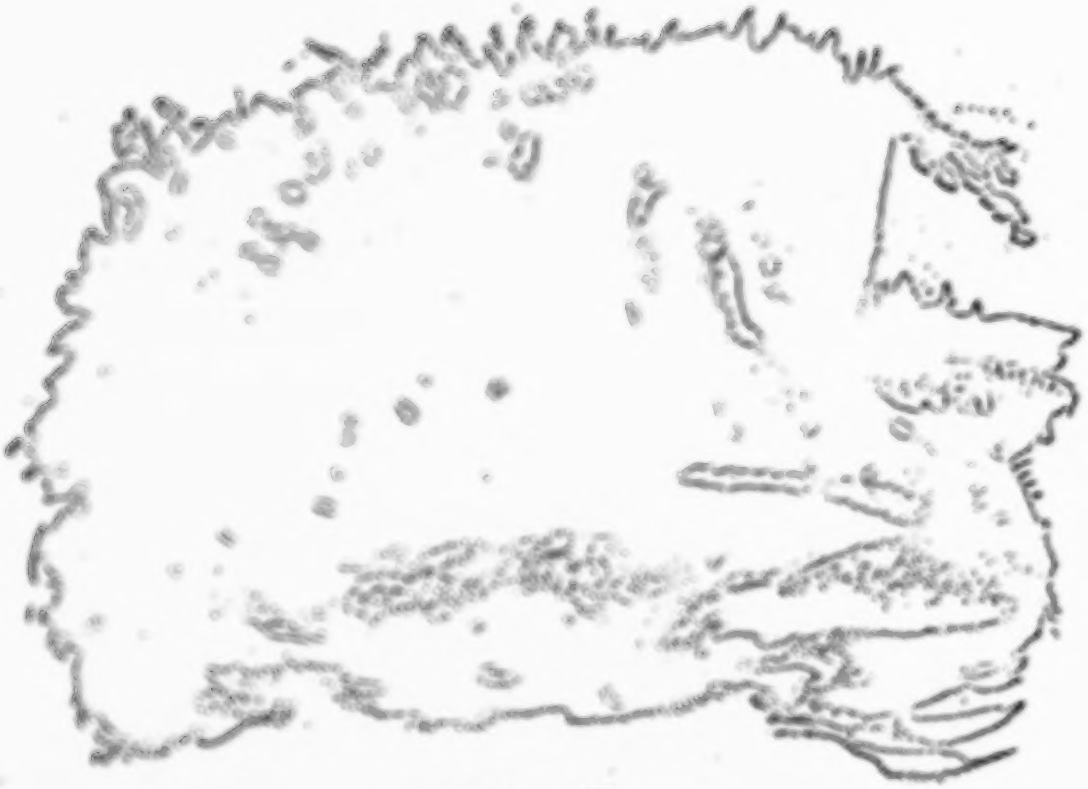
be hind
li on
a sleep
cor al
cous in
hun gry

wel come
bee hive
de cide
is land
a shamed
a board

stop per
un load
hur rah
boil ing
him self
glass es

thirst y
sur prised
mus tard
buck et
broth er
chil dren

[illegible]



Baby Foxes

Four baby foxes, four little balls of fur, were alone in their den. Their mother and father were away from home on a hunting trip. So the four babies were waiting for their parents to return.

Their den was near an old tree by a big pond. Around it were wild flowers and bushes. Near the den was an open space. That was where the baby foxes played. Here and there on the ground were some gnawed chicken wings and scattered bits of food.

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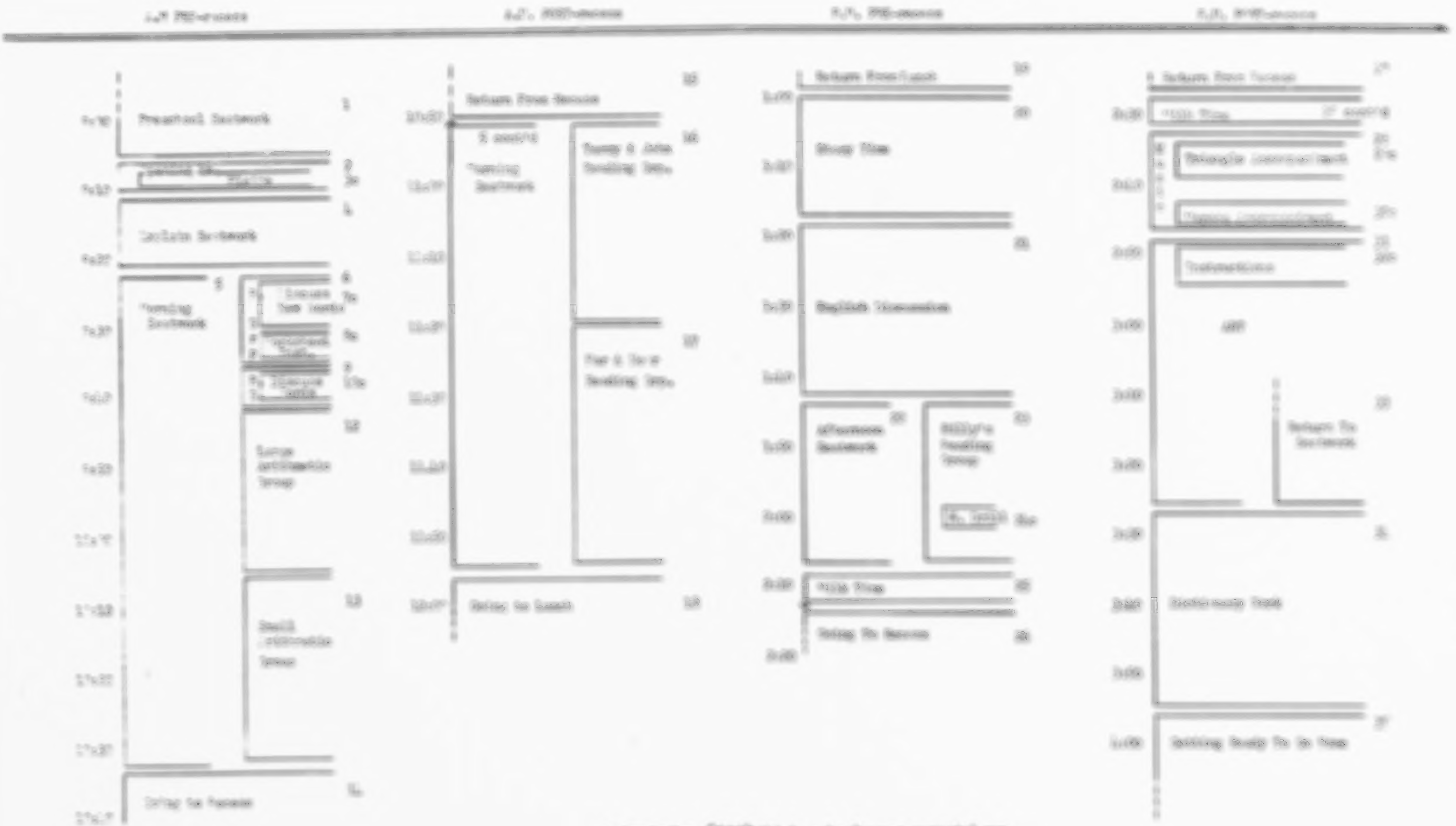
Flying feet and wildly waving tails were all that could be seen. The foxes pulled, twisted, and growled as each one tried to break away from his brothers.

Finally they were free. One by one they squeezed into the den. Then they turned around and put their cunning faces through the opening. Now they could look out at the open space and see what was coming.

But it was not an enemy that had made them dart to their den so rapidly. It was the sound of their parents' footsteps. The mother and father fox were returning home. Now their four little babies were all in the den ready to greet them.

Now they were well-behaved little foxes. They were four babies waiting hungrily for their parents to bring them food.


A.M. PRE-recess
A.M. POST-recess
P.M. PRE-recess
P.M. POST-recess
Morning Seatwork
Return From Recess
Morning Seatwork
Tommy & John Reading Grp.
Pat & Terry Reading Grp.
Going to Lunch
Return From Lunch
Story Time
English Discussion
Afternoon Seatwork
Billy's Reading Group
Milk Time
Going To Recess
Return From Recess
Milk Time
ART
Return To Seatwork
Getting Ready To Go Home

A Day in Mrs. [illegible] third grade class: a segmented day

Appendix [illegible]

Appendix C

INSTRUCTIONS FOR SEGMENTATION
(Excerpts)

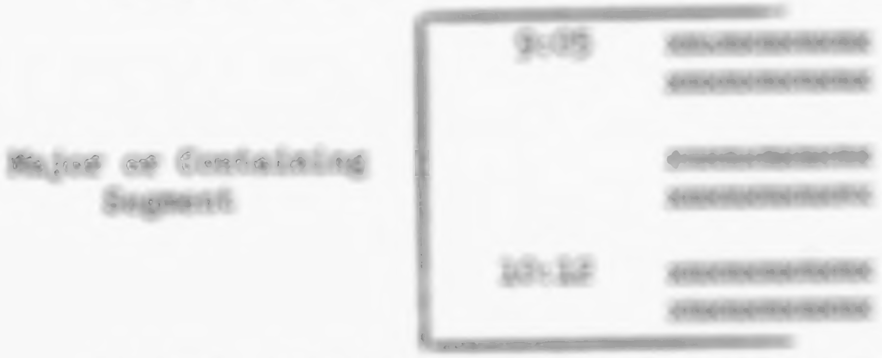
The first step in breaking a record into segments is to read the chronicle thoroughly; a single, brief statement may be enough to change or influence the marking of a segment or sub-segment.

MARKING

Mechanically speaking, the type of marking used in dividing the chronicle is very similar to that used in episoding. It is utilized principally because of the ease with which the markings may be added to or placed alongside the written record itself.

MAJOR (OR CONTAINING) SEGMENT

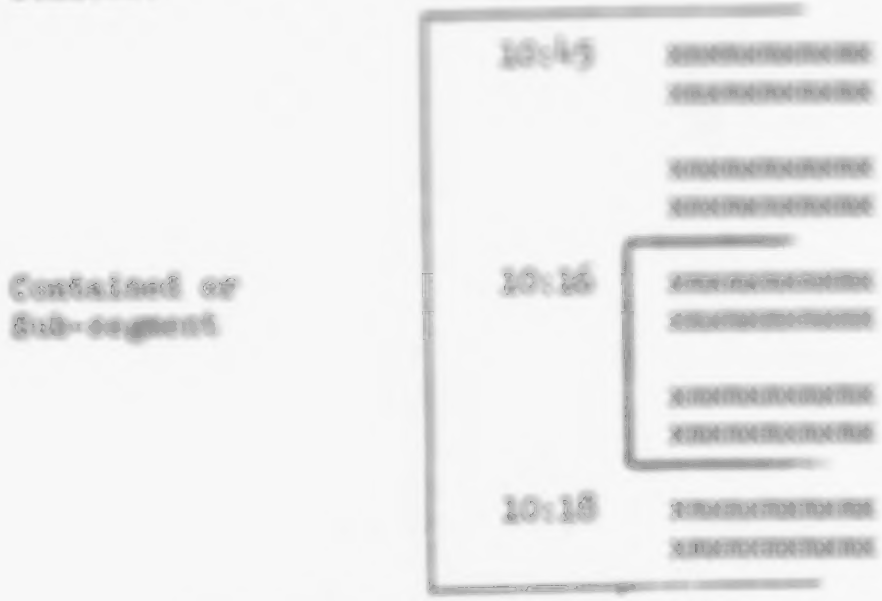
A major (or containing) segment is marked as follows:



That is, the signification of a segment is simply an extended bracket. The bracket itself is placed at the extreme left of the record.

CONTAINED SEGMENT

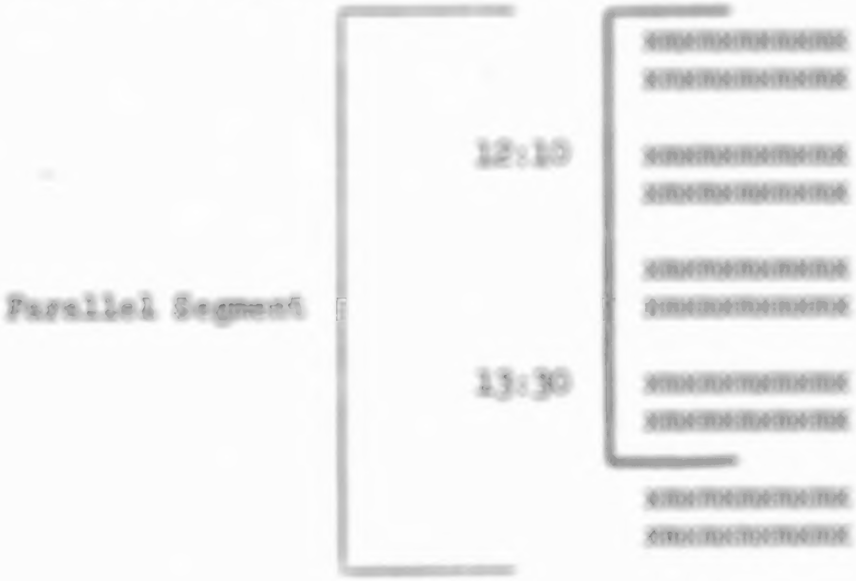
A contained segment (loosely, a piece of a larger containing or major segment) is indicated by using the same sort of bracket within a larger (segment) bracket. It is placed inside (to the right of) the time notations, close to the typescript, on the chronicle. The contained segment is also called a sub-segment, and is marked as follows:



PARALLEL SEGMENT

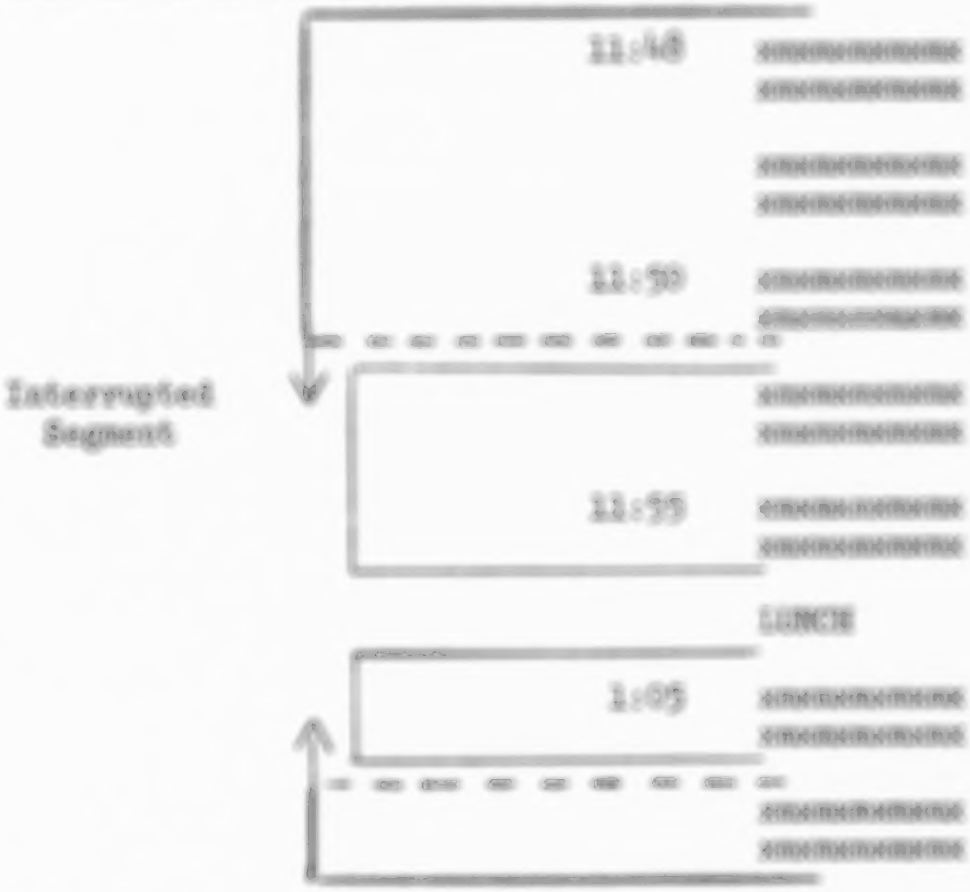
A parallel segment is a major segment alongside a major segment. These are two distinct major segments essentially related to each other only in that they occur within the same time period. When two (or more) segments are occurring at the same time, this will usually indicate that the Teacher (T) is using subgrouping in the classroom--subgrouping refers to those situations in which the T has one group of children doing one thing and a second (or third) group doing something else, usually in a different place in the room; e.g., two-thirds of the children are working at various tasks at their desks and T is with a reading circle in the back of the room.

The parallel segment is drawn exactly the same as the major segment, except that the two will be side by side. The parallel segment line should be placed just inside the time notations on the record (to the right of the time notations).

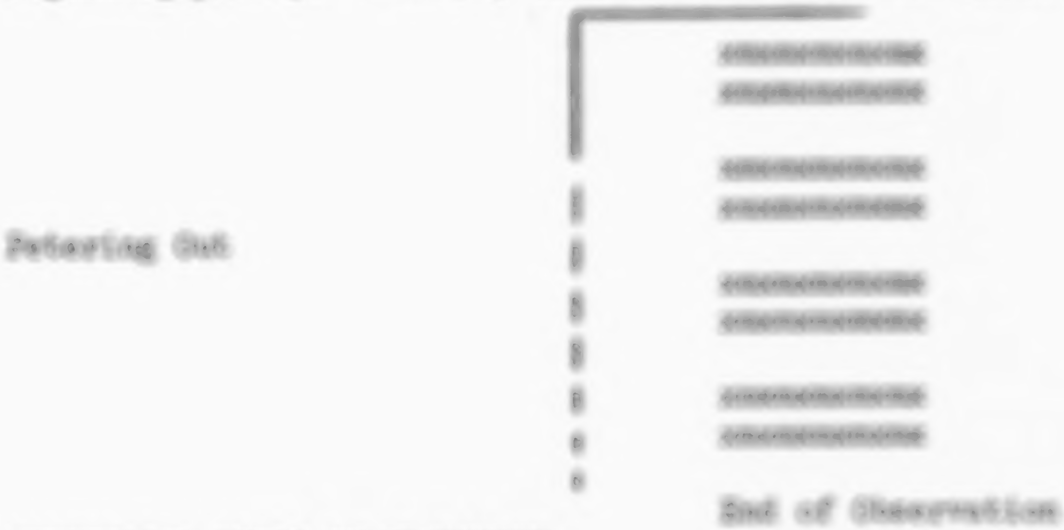


INTERRUPTED SEGMENTS

There will be times when a segment (major, containing, contained and/or parallel) may be interrupted for a length of time. Such cases should be strictly reserved for such clear-cut occasions as when T starts a reading group and a seatwork group before recess and continues them after the recess break. When there is an indication that a segment has been started the day before the observation and is about to be continued on the day of the observation, we will not consider this as an interrupted segment.



Occasionally, particularly at the end or beginning of the day, a segment may seem to peter out or peter in (has no distinct end or beginning point). This may be indicated by dotted lines:



ADDITIONAL NOTES ON MECHANICS

Each segment should be labeled with a descriptive phrase indicating something about the subject matter and action pattern

Listen, Speak and Write Discussion
Roads to Follow Reading Group
Social Studies Reports
Correcting Worksheets
Morning Seatwork
Return from Recess

Each segment should be numbered in sequence from the beginning of the record to the end of the record. The letter "C" should be added to the number identification of the contained segments for easy and rapid distinction of these segments.

IDENTIFICATION OF SEGMENTS

There are two basic dimensions to be kept in mind when chunking the chronicle: (1) Concern (Subject Matter and Other Routines) and (2) Activity Pattern Change.

Subject Matter

There are 14 different kinds of subject matter possible, based on curriculum as defined by the University City Public School System:

ART
MUSIC
SOCIAL STUDIES
READING
ARITHMETIC
SCIENCE
HANDWRITING
ENGLISH
SPELLING
SPANISH
HEALTH
PHYSICAL EDUCATION
MILK TIME
STORY TIME

In addition to the subject matter areas, there are routines such as major movements (going to Recess [Lunch, Home] and return from Recess [Lunch]); Exercises; Opening Rituals; Flag Salute and Song, etc.

A change from any one of the concerns to another will indicate some kind of change in the segment patterning. However, in cases such as that of Milk Time and Story Time: when these two occur simultaneously, they should be considered as one segment NOT two parallel segments. If they are not combined (Milk Time is at 1:15 p.m. and Story Time doesn't start until 1:30), each may be considered as separate subject matter.

Activity Pattern Change

This refers to a change in the general format of participation in the class (or group) or who is doing what in relation to whom. Sample activity patterns: T instructs, children listen; T asks questions and calls on children to recite; T supervises, children do quiet seatwork; T calls on certain children one by one to give a report, most children listen to the report of their classmate. A simple listing of these patterns is not entirely possible, but when the pattern definitely changes (and these changes are usually fairly obvious), this also indicates some kind of change in the segment patterning.

Thus it can be seen that segmenting these chronicles is an attempt to get at the classroom environment of the children--to almost literally draw a picture of the arenas which exist for them, in which they are operating and which in turn influence their patterns of behavior.